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Everything you need to know about the upcoming 3G hard drive spec!

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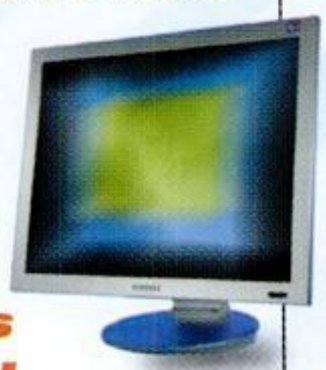

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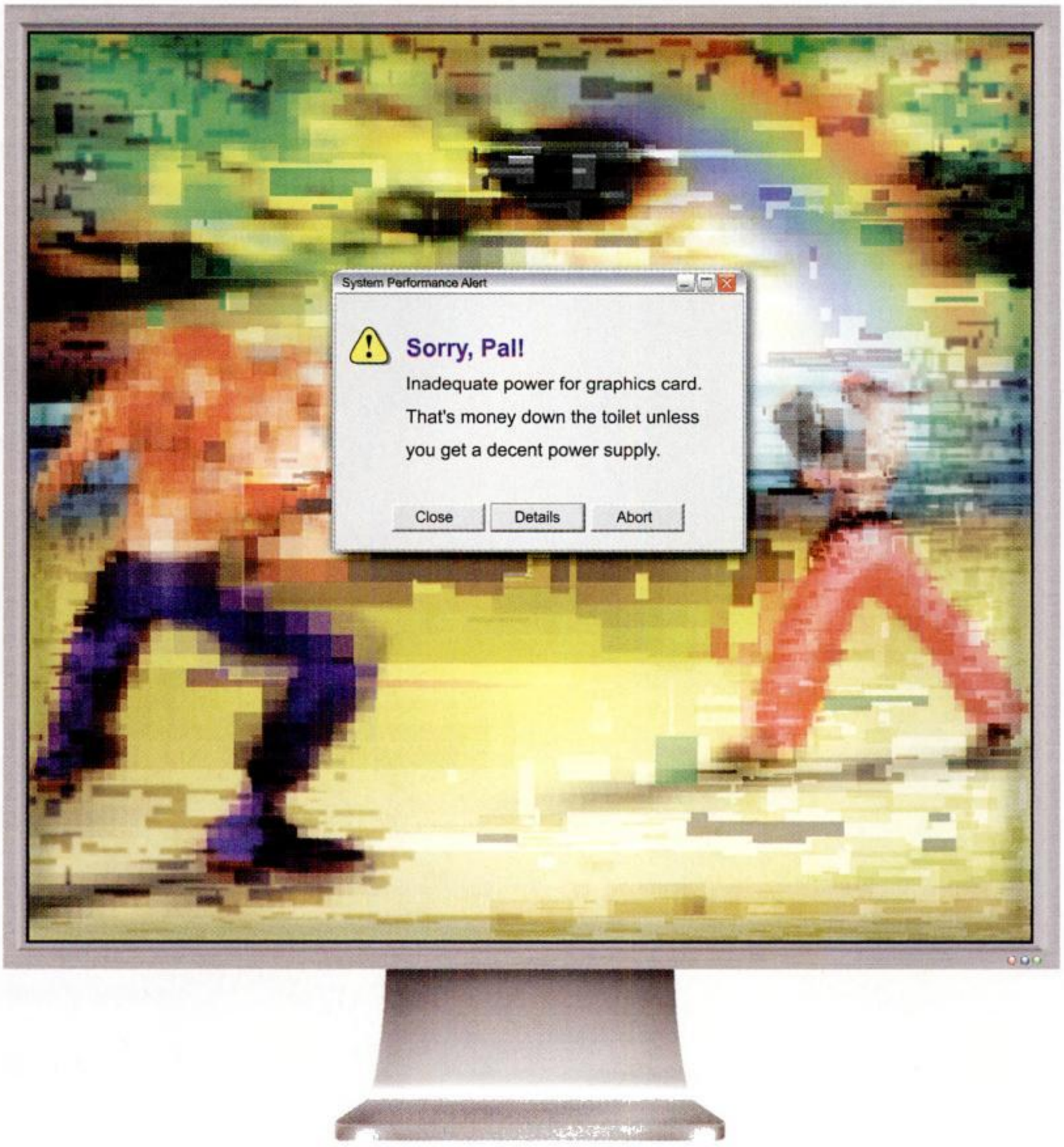

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Release Notes

Apple's x86 Invasion

The earthshaking, D-Day announcement that Apple is switching from IBM's PowerPC architecture to Intel's x86 is, without a doubt, the biggest tech story of the last five years. I think it's just the first attack in Steve Jobs' 10-year campaign to assault Microsoft's impenetrable Western Front—aka the Windows Monopoly.

The back story reads like a cloak-and-dagger military op. Jobs revealed that for the last five years, Apple has simultaneously developed both PowerPC and x86 versions of OS X. (Those crazy rumors were true!)

Of course, Apple's official reason for the switch sounds innocuous and makes sense. Apple has finally conceded that the ludicrous thermal profile of the G5 processor is a big problem. In fact, the IBM-produced CPU runs so hot that desktop units actually require water-cooling. Putting a G5 in a laptop is thus out of the question, and so without a switch, Apple laptops would forever be limited to the inferior G4.

Apple is shipping x86-powered Macs to developers right now, and expects to start shipping IMacs (that's the Intel Mac) to consumers sometime in '06. Publicly, Apple reaffirms its position as a personal computer manufacturer: You won't be able to run OS X on non-Apple hardware (though Apple "won't preclude" users from dual-booting OS X and Windows on Mac hardware).

My take? Apple's spewing hogwash. OS X will eventually be cleared for use on PCs, and then, finally, we'll have a legitimate OS war at hand. In fact, the time is right for Apple to make the move from hardware builder to OS vendor. Windows is a mess. Spyware, viruses, and all the problems inherent to a 4-year-old OS have left Joe and Sally Consumer without a reliable home computer. The PC isn't the problem. Windows is the problem.

Make no mistake, a large-scale launch of OS X for all PCs is inevitable. Apple's current position is just a smoke screen in order to build a software application base and work out kinks in its driver model. After five years of planning, Jobs and company have launched their first assault on Windows. I bet we'll see a full-on war by the end of 2006. Will Longhorn be enough to repel the Apple invasion? Only time will tell.

—WILL SMITH
will@maximumpc.com

NEXT MONTH: THE REDESIGN
I'm proud to announce that next month's issue will feature a bold new look and feel for *Maximum PC*. In addition to giving the mag a cleaner, easier-to-read aesthetic, we're adding a new section: R&D, which will feature in-depth white papers and previews of the very latest PC hardware. See you in September...

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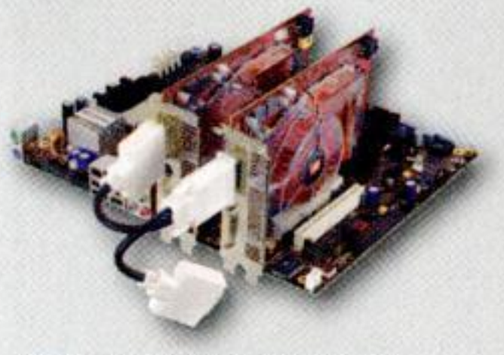

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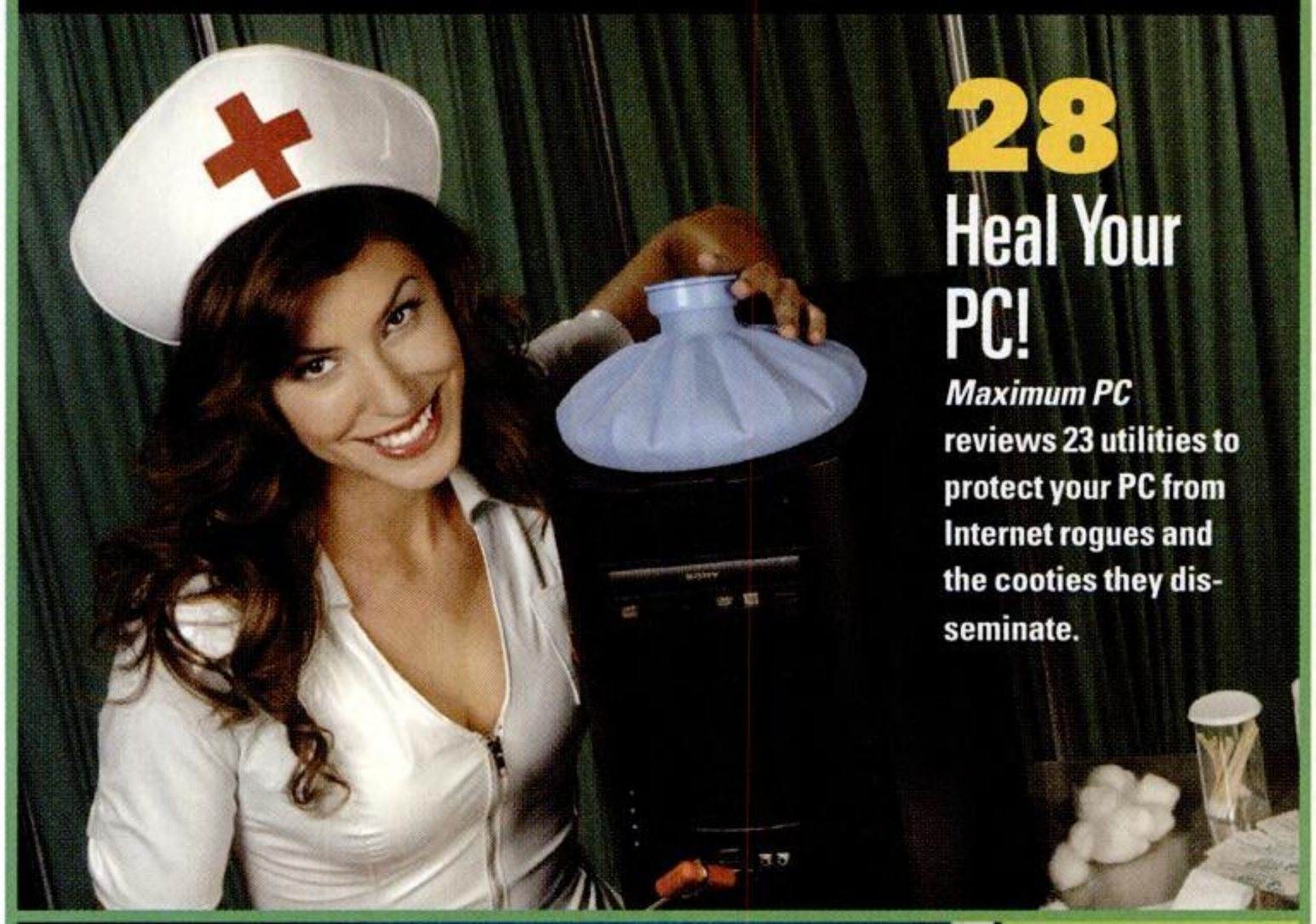
AUGUST **FEATURES**



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In/Out

You write, we respond

WHICH VIDEOCARD?

I built a new rig for *Quake 4*, but the only thing holding me back is my videocard. I currently own a card based on ATI's Radeon 9600 XT, but it exhibits considerable lag in many of the new games I play. I was considering something based on nVidia's GeForce 6800 Ultra, or one based on ATI's Radeon X850 XT Platinum Edition. Which do you believe will provide the best results for upcoming games?

—DANIEL FREDERICK

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: Both ATI and nVidia are on the cusp of shipping brand-new product that—if the hype is to be believed—will leave their current-generation products in the dust. If you can wait another month, do.

Based on the cards you've mentioned, you're looking for high-end graphics performance for games; and for that, you'll want a dual-GPU solution—even if your budget forces you to buy them one at a time. ATI's recent CrossFire announcement means the company now has a dual-GPU weapon to wield against nVidia's SLI (see page 14 for details). The only problem is that you won't be able to use it unless you buy a new ATI motherboard.

You say you've already built your new system, but you don't say which chipset you decided to use. If it's not nVidia's nForce4, you won't be able to go SLI, either. Of course, if you really want to get the best card for *Quake 4*, the only way to ensure that is to wait until after the game ships and benchmarks of final code are available. We're not trying to dodge your question—we just really think it's in your best interest to wait a little while longer to allow the dust to settle.

STEP AWAY FROM THE BLEEDING EDGE

You should publish a chart that lists all the benchmarks for all the videocards you've tested over the years. I typically buy the best stuff from six months to a year ago. I can't afford the bleeding-edge gear for myself, so I always strive to get the best bang for the buck. Sometimes that means a brand-new middle-of-the-road card, and sometimes it means last year's top-of-the-line card. But it's difficult to compare a $150 Radeon 9800 Pro, for example, with whatever new videocard is selling for $150.

—JEFF MARKOWSKI

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: We can understand your desire to stay away from the bleeding edge, Jeff. The problem with publishing this kind of evaluation, however, is that benchmarks change so rapidly that it's difficult to make fair comparisons between more than two generations of videocard technology. Unless we retested every old videocard every time we updated our benchmarks—a logistical nightmare, as you might imagine—we'd be comparing apples to oranges.

HYPER-THREADING HYPER-SUCKS

I believe your statement in June's dual-core story is inaccurate: "As you can see, playing *Quake III* on our dual-core P4 system barely registered on the CPU Usage graph."

Quake III might use more than 25 percent CPU if it were multiprocessor aware! Because it's single-threaded it can ONLY use a maximum of 25 percent of what's available on a four-CPU rig! Turn off Hyper-Threading and retest to see if it maxes out the CPU at 50 percent, which would imply that it still requires more juice to keep it satisfied.

I have always been very disappointed with the lack of multiprocessor-aware apps, especially games. I've found that most games use only one CPU. When I saw your Task Manager screenshot showing percentages

WHERE'S THE FUNNY?

After reading hundreds of entries for our June photo caption contest, we've finally picked a winner. Entries ranged from the very punny to extreme-groaner to 'huh?' The one thing we found out for sure is that Maximum PC readers have a quirky sense of humor. Here's the winner, and a couple of one-liners that made us chuckle.

THE WINNER

Lyndon Unger gets top honors, for what we're calling "Reality in Redmond".

Having hoped for a welding test in the final round, Bachelor No. 1's worst nightmare becomes a reality.

But when the ratings for *Who Wants To Date a Microsoft Employee?* drop below those for Ronco fruit-juicer infomercials, network interns brainstorm ways to spruce up the show—with canings!

Shortly before it folds completely, the network experiments with an "original" television program, a race involving operating-system mascots and Anna Nicole Smith. She misses the first day due to a hangover and the show is cancelled, but not before Tux makes an appearance.

HONORABLE MENTION

➤ **Brian E. Cucksee wins the Best One-Liner award for his penguin-picture caption: Linux drivers are getting easier to find every day!**

BANG A GONG

➤ **Finally, an entrant known only as JJJ gets the gong for this gem:**

1. **I have cord in mouth**
2. **I instruct you now**
3. **Penguin in car snickers**

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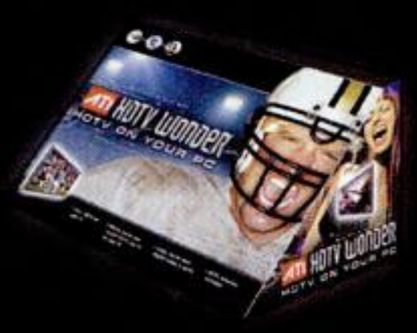

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COMING NEXT MONTH

IN THE *NOW-WITH-30-PERCENT-MORE-FLAVOR* SEPTEMBER ISSUE OF *MAXIMUM PC*

DREAM MACHINE 2005

El Gigante. **The Big Kahuna. 42 pounds of brute strength in a box that's goin' Krakatoa on our benchmark tests. That's right—*Maximum PC* lays out the blueprints to the fastest, meanest rig we've ever built, and you won't believe what's in the brainpan. Find out next month when we build our 10th Anniversary Dream Machine!**

AIR-COOLING BUYER'S GUIDE

We've rounded up more than a dozen fresh-baked heatsink/fan combos for a test spin on both AMD and Intel systems. We'll tell you which ones are the quietest, which are the coolest, and what you should look for when shopping for a heatsink/fan.

5 IDEAS MICROSOFT SHOULD STEAL

Microsoft bought itself some extra time to do homework on Windows Longhorn—we hope they'll use it to consider adopting these five features from other operating systems, to combine ease-of-use with the most power and flexibility that an OS can provide.

of 0, 0, 100, and 0, I was again ticked off by *Quake III's* inability to use all four logical CPUs (this is why I always immediately turn off Hyper-Threading on my new gaming PCs). I don't know what Intel was thinking: An engineer must have found a way to cripple your gaming CPU 50 percent, and then the marketing guys called it "Hyper-Threading"!

—HENKO TERBLANCHE

SENIOR EDITOR GORDON MAH UNG RESPONDS: I agree that it's sad so few games actually take advantage of multiprocessor, dual core, or Hyper-Threading, but you're being unfair to id Software, as *Quake III* is one of the only games that very nearly supports dual processors. By running the command R_SMP you can sometimes get the game to work with dual-processor and dual-core machines.

I also think you're mistaken by how much Hyper-Threading hurts gaming. While there is a slight overhead cost from Hyper-Threading, it doesn't slow games down by 50 percent. Turning Hyper-Threading on or off yields very little performance difference. Despite the fact that your Task Manager shows only 50 percent CPU usage in Hyper-Threaded systems, the partitioning scheme doesn't evenly split a proc's resources down the middle. Unless another thread is competing for the same resources, a single-threaded game like *Quake III* should be able to fully use the parts of the CPU it requires.

BACK TO THE FUTURE!

Your "Dual Core Academy" article in the June issue looked more like an advertisement for Intel's new Pentium D than anything written by *Maximum PC*. For shame! You only provided benchmarks for Intel processors! I like the diagrams explaining the differences between dual-processor and dual-core systems, but you should have published benchmark numbers! I have come to expect more out of *Maximum PC*. At the very least compare AMD to Intel.

— DANIEL AYOUB

SENIOR EDITOR GORDON MAH UNG RESPONDS: While it's true we have access to a DeLorean (an editor at our sister publication *Official Xbox Magazine* owns one), it's been in the shop since February. Without access to the Mr. Fusion power generator, we couldn't jump ahead in time the six weeks we needed to get an Athlon 64 X2 4800+. (The dual-core Athlon was not available until after we sent the June issue to press.) Of course, once we received the X2, we got straight to work comparing the competing dual-core procs. Turn to page 20 for the whole story.

DO YOU EQ?

I believe proper equalizer settings are key to achieving optimal sound quality from your speakers. I think you could make a $30 set of speakers sound decent with the right EQ, so I was wondering what equalization adjustments you make when you test speakers? Do you make different adjustments for each test, or do you keep all your settings static?

—RONAK PATEL

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS: An equalizer's principal function is to make a sound system sound better by customizing its frequency response to your listening environment. Because our listening environment is likely to be very different from everyone else's, we don't use an equalizer because it would color the results of our speaker tests and would make it more difficult to do apples-to-apples comparisons.

STRANGE BUT UNTRUE

You've stated in the past that there's no dramatic difference between DVD+R and DVD-R, and that users should choose whichever format is compatible with their DVD players. But if you use recordable DVDs for archiving files, this isn't true—DVD-R doesn't work well with some files. For example, burning data to a recordable DVD-R with data verification turned on will only succeed about one in three times, whereas DVD+R will work every time (short of a bad disk).

—RICHARD PAYNE

FEATURES EDITOR LOGAN DECKER RESPONDS: When you're writing digital data to any medium, you're simply writing 1s and 0s. The type of data you're writing—a *Word* document, a bunch of MP3s, a Zip archive—makes no difference. It's still just 1s and 0s to your optical drive. So our guess is that your drive, for some reason, simply cannot write to this format correctly. If it matters to you, you might find that switching to another brand of media helps, but it sounds like you're fine with DVD+R.

MAXIMUM PC: BUTTON PUSHERS

Your electric pickle "experiment" in the April issue pushed one of my fun memory buttons! I remember waaaaaay back when I was in junior high school (about 1960) there was a gadget actually being sold that did exactly what you describe. It was basically a square plastic box with a row of pins about five inches apart running down each side. You speared a hot dog on each side and plugged the thing straight into the outlet. The grease and moisture content of the wiener was just right to conduct enough current to heat up the dog in no time! As it got hotter, the grease and moisture cooked out of the wiener causing it's conductivity to go down, and eventually the current tapered off to a safe level that would not incinerate the meat. When it was done, you took the wiener out (hopefully after first unplugging the device) and had a nice, quick, fresh hot dog!

—PETE KAY

FEATURES EDITOR LOGAN DECKER RESPONDS: Whoa! OK, just to be clear—the pickle trick delights with the eerie, although brief, internal glow of the veg-

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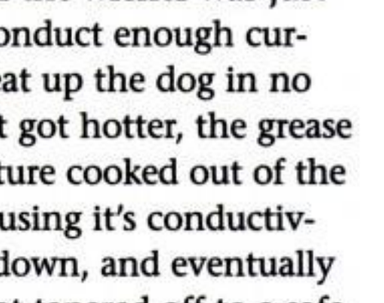

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etable as it's tortured to death, not with its savory electrocuted taste. Judged entirely on the smell, we do not recommend that anyone eat the pickle afterwards. Nonetheless, we're heading straight to eBay for this no-waiting hot-dog gizmo. And the first thing we'll do when we get it? Overclock!

SINKING CENSORSHIP?

You may want to let your readers know that HDTV is no longer "under fire" as your June 2005 Quick Start article reported. The DC Circuit Court of Appeals rejected the broadcast flag on May 6, 2005, prompting people with functioning brains and beating hearts to rejoice.

—KEVIN ONKEN

FEATURES EDITOR LOGAN DECKER RESPONDS: The FCC might have thrown in the towel, but we think it's a tad premature to celebrate the court's decision. The ruling, which we reported in our July 2005 issue, merely establishes that the FCC has no authority to mandate the broadcast flag. And although the Motion Picture Association of America was rebuffed again by the House of Representatives, who declined to add a broadcast flag provision to the legislation that establishes a 2008 "hard" deadline for switching from analog to digital transmission, don't think the organization will give up. There's plenty of time in the next few years for the MPAA to lobby for broadcast-flag support, which could be slipped into a future and possibly even unrelated bill.

It gets worse. Senator Ted Stevens (R-Alaska) told broadcasters that he intends to support legislation that extends the FCC's authority to apply the same "decency" standards imposed on over-the-air transmission to cable and satellite transmissions as well. Feeling a little uncomfortable? Follow the news at the Electronic Frontier Foundation (www.eff.org), and let your local politicians know how you feel. ■

BUILDING A GREEN DREAM MACHINE

One area I keep hoping to hear more about is power savings. You regularly report the solutions for maximum power, and lately you've been reporting on noise reductions. Well, I'd like to know about maximum energy efficiency. I live in a state where the power rate per kilowatt-hour is obscenely high. I built a killer machine a couple years ago and was very proud of it, until I got my next electric bill. YIKES!

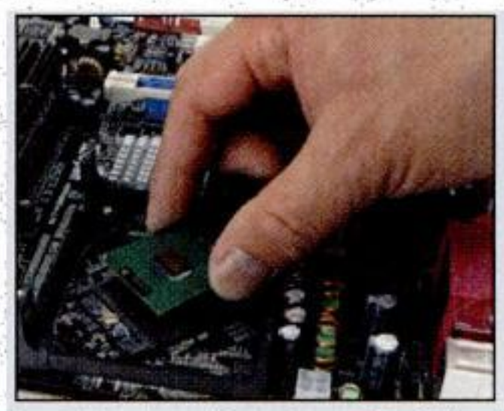
Can you please challenge your staff to build the most energy efficient system while retaining an acceptable level of performance?

I don't think any of these thoughts are outside Maximum PC's area of expertise. I understand that MPC likes to think of itself as an extreme-performance mag, but there is merit to exploring other extremes. Greening up the system, I think, is one place to start.

—STEVE ROBINSON

SENIOR EDITOR GORDON MAH UNG: That's a great idea, Steve. This topic cropped up during the California power outages but once the artificial power crimp passed, most of us went back to our old energy-guzzling ways. We'll take a closer look at greener PC configurations in an upcoming issue, but I can give you some recommendations off the top of my head.

One of the biggest power-guzzlers in the system is the CPU. Co-opting Intel's wonderful Pentium M mobile processor for a desktop PC would provide the best performance-to-power ratio today. Paired with an Aopen i855 mobo, a Pentium M yields an amazing amount of power, without the heat and with very little power consumption. You can also swap out high-speed 10,000rpm hard drives for slower, more energy-efficient 5,400 or 7,200rpm jobbers.



If you want to build a power-sipping PC, look for low-power components. The Pentium M CPU we used in our "Build a Quiet PC" how-to is a great place to start.

demonic possession

de•mon•ic (dĭ-mŏn′ĭk)
adj. pos•ses•sion (pə-zĕsh′ən)

BEING COMPLETELY CONTROLLED BY *passion* OR THE SUPERNATURAL

A *mania* RESTRICTED TO ONE THING OR IDEA AT THE EXCLUSION OF ALL ELSE

MOTIVATED BY A *spiritual* FORCE OR GENIUS; INSPIRED

THE STATE OF A HUMAN BODY UNDER DEMONIC *influence*, WITH THE INTENTION OF USING IT FOR *punishment* OR A TEST.

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TEEN
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Violence

dice

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PC DVD-ROM SOFTWARE

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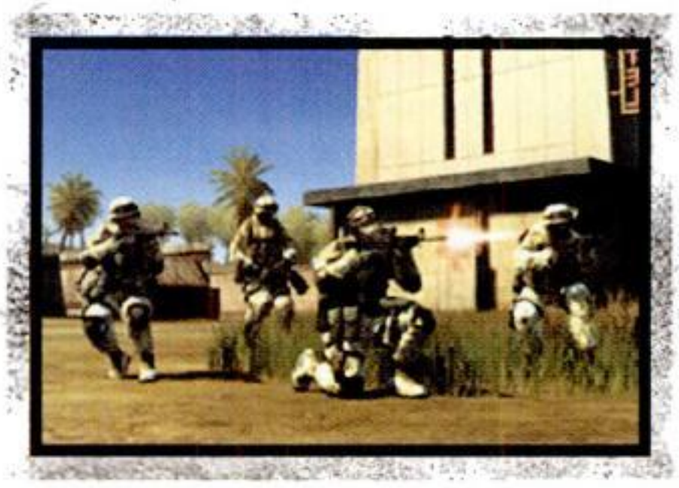

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BATTLEFIELD 2

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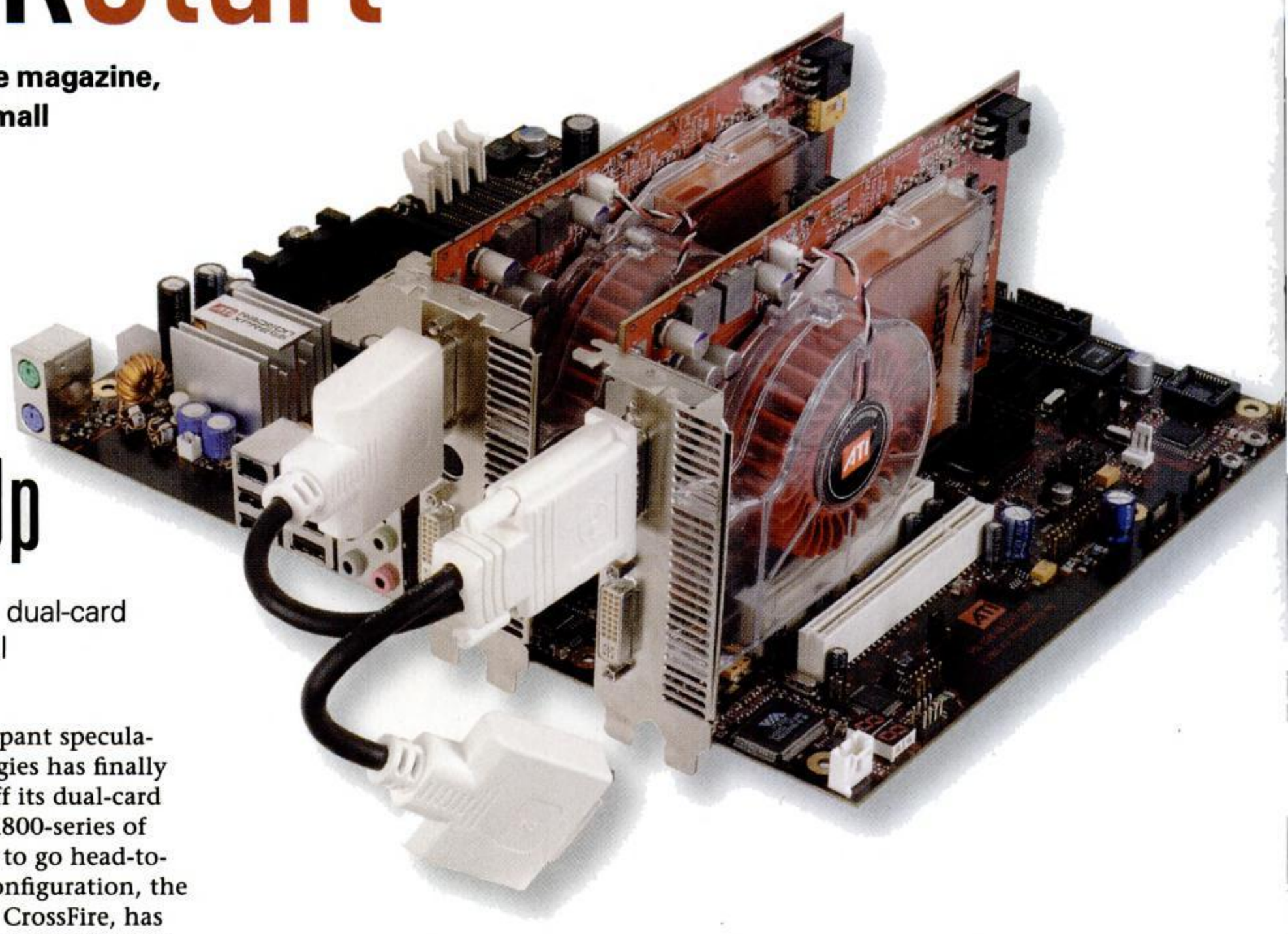
QuickStart

The beginning of the magazine, where articles are small

ATI Doubles Up

Finally, ATI reveals its dual-card answer to nVidia's SLI



Unlike nVidia's SLI, ATI's CrossFire connects the cards outside the case. There are no internal jumpers to set either.

After months of rampant speculation, ATI Technologies has finally pulled the wraps off its dual-card solution for its Radeon X800-series of graphics cards. Designed to go head-to-head with nVidia's SLI configuration, the new technology, dubbed CrossFire, has some tantalizing features and differs significantly from nVidia's tech.

Because any sort of dual-card setup requires motherboard chipset support, upgraders will need to purchase a "CrossFire-ready" motherboard (outfitted with a new rev of ATI's Radeon Xpress 200 chipset) and a CrossFire Edition graphics card, to work in tandem with any other PCI-E Radeon card. CrossFire Edition cards will be available in three versions: Radeon X850 256MB, Radeon X800 256MB, and the Radeon X800 128MB. As of press time, it seems likely your dual-card mobo will be ATI-branded. ATI will support the entire range of AMD and Intel desktop CPUs, including both companies' dual-core product.

THREE-HEADED CABLE

Unlike nVidia's SLI, which connects both cards internally, CrossFire requires the cards to be connected *outside* the case using a three-headed cable. While gaming, the "non-CrossFire" Radeon card will process its share of the workload and send its output to the CrossFire card, which receives it, merges it with its own rendering (more on this later), and outputs the combined signal to a DVI connector that emerges from the same plug. Each card tackles half the rendering workload, using one of three modes: SuperTiling, Scissor, or Alternate Frame Rendering. In SuperTiling mode, which is supported in Direct3D applications only, each GPU will render alternating tiles within each frame. ATI claims that this technique enables both GPUs to operate at their maximum capacity at all times.

In Scissor mode, supported in both Direct3D and OpenGL applications, each GPU renders half the frame (one takes on the top half of the frame; the other, the bottom). Alternate Frame Rendering mode, also supported in both D3D and OGL, operates just the way it sounds: One GPU renders the odd-numbered frames and the other renders even-numbered frames.

In all three modes, a compositing engine on the CrossFire board combines the two renders into the final frame that's sent to the display. The application will automatically choose a default rendering mode, but users will be able to select a different rendering mode using ATI's Catalyst control panel.

MIX-N-MATCH

Unlike nVidia's SLI solution, you'll also be able to mix and match a variety of Radeon boards—with some limits. For example, the 256MB X850 CrossFire board is compatible with any flavor X850 board, and both the X800 CrossFire boards are compatible with any X800 board. The catch is that the CrossFire board will revert to the lowest common denominator in any memory, pixel pipeline, or clock-speed configuration; so if you install the 256MB X800 CrossFire next to a 512MB X800 XL, half the frame buffer on the 512MB X800 XL will go unused. This parity requirement applies to pixel pipelines, too: Both CrossFire boards have 16 pipes, but if an X800 CrossFire is paired with a 12-pipe X800 Pro, four of the CrossFire's pipes won't function.

ATI will offer its own CrossFire boards, and the usual suspects (Asus, Gigabyte, Sapphire, et al) have signed on as partners. The boards weren't shipping at press time, but we should have them very soon. Look for benchmarks next month (hopefully)!

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Seagate Unloads 10 New Drives

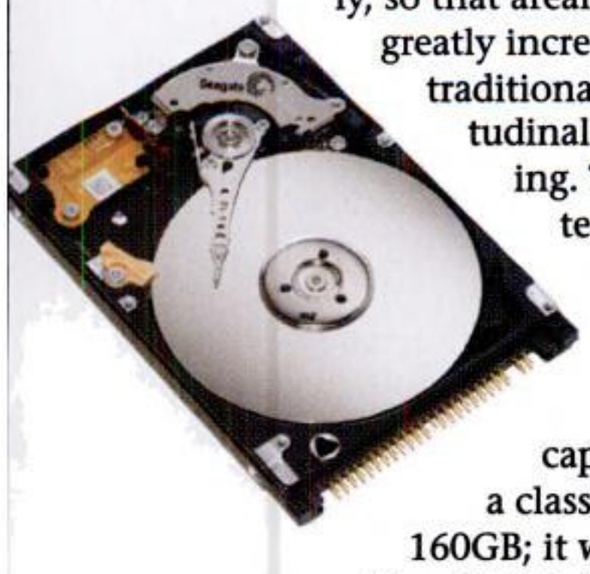
Even though we reviewed Seagate's flagship 7200.8 drive just a few months ago (April 2005), the company has already announced the drive's successor—the unsurprisingly named 7200.9—as well as nine other new drives for everything from notebooks to cellphones and MP3 players. Let's take a closer look at some of the more titillating specimens.

Barracuda 7200.9

The ninth-generation Barracuda gets a capacity increase to 500GB (it will be available in smaller sizes as well), matching Hitachi's recently released 7K500 for the desktop drive–capacity crown. It will be Seagate's first SATA 3G drive, and will also sport the now-standard 16MB cache. One interesting design change is the move from three platters to four platters. (Hitachi's 500GB drive uses five platters.) The Barracuda will also support NCQ, staggered spin-up, hot swapping, and will be compatible with the new ClickConnect SATA cables.

Momentus 5400.3

The third-generation Momentus might not seem all that enticing, but check this out: It'll be the first consumer-level drive to use perpendicular recording technology, which stores bits vertically, so that areal density is greatly increased over traditional longitudinal recording. The new tech allows Seagate to push this drive's capacity to a class-leading 160GB; it will come with a SATA interface and NCQ as well. The Momentus should make a fine option for cool, quiet storage in a small formfactor PC.



Momentus FDE

The FDE stands for full-disk encryption, and this notebook drive will automatically encrypt everything written to it on-the-fly. It also supports the scary-sounding Trusted Platform Module (TPM) that we wrote about in July. The TPM can tie certain files to a specific drive or user. Of course, the true benefit of this drive is that if someone steals your notebook, they'll never be able to recover the data, which means nobody will ever know you have William Hung on your *iTunes* playlist.

ST1

This little bambino is now packing a hefty 8GB of storage capacity and will be offered in a Compact Flash interface for digital photographers.

Portable External Drive

Our favorite portable drive is getting a capacity boost to 120GB and will also be offered in 40GB, 60GB, 80GB, and 100GB versions, which should please all comers. The formerly USB-only drive will also receive a bus-powered FireWire interface and will come with backup software, too.

FAST FORWARD BY TOM R. HALFHILL

Supercompter Game Machines

Microsoft, Nintendo, and Sony have revealed some tantalizing details about their next-generation home videogame consoles, and the technology is breathtaking. Not long ago, these game machines would have been called supercomputers. Should PC gamers be jealous? The answer is no, for three reasons.

First, the computer and console markets aren't mutually exclusive domains; millions of people are comfortable owning both consoles and PCs. This fact is often overlooked by online flame monkeys who insist on pitting PCs against consoles, as if it's another PC-vs.-Mac feud. In reality, avid gamers can't keep their gamepad-hands off either PCs or consoles. There will always be some gotta-have-it games that run on only one particular platform, or appear on one platform first, or simply work better on one platform. And despite mighty efforts by Intel and Microsoft to invade your living room with "media centers," their thinly disguised PCs aren't as friendly or as foolproof as game consoles.

Second, videogame consoles improve their performance as a step function, with sudden leaps every few years when a new generation of console technology hits the streets. Between those generational leaps, the performance of game consoles doesn't improve at all. By contrast, PCs slowly but steadily improve their performance on an almost daily basis, with each new release of a faster microprocessor, graphics card, disk drive, memory chip, or I/O interface. Even if a new console has a technical advantage when it first hits the market, your PC is stiff competition in the long run, and pretty soon you'll get it upgraded and be on top again.

The third reason why PC gamers shouldn't be jealous of consoles is that the new machines will be sheer hell for game programmers, especially in the early phase of software development. History indicates that programmers will need at least two years to master the new hardware and begin writing their best stuff.

Consider what's inside the Cell chip for Sony's PlayStation 3. The control processor is a dual-issue superscalar 64-bit PowerPC processor core with two-way hardware multi-threading. They have a new instruction-set architecture, which means Cell programmers must wrangle two different CPU architectures while writing multi-threaded, multitasking, parallel-processing programs using strange new software tools on a strange new chip.

Maybe it's called Cell because that's where the programmers will end up—bouncing off padded walls in straitjackets.

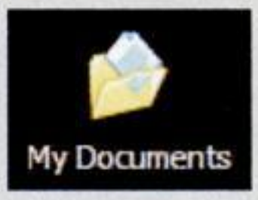
Tom Halfhill was formerly a senior editor for Byte *magazine and is now an analyst for* Microprocessor Report.

FUN-SIZE NEWS

INTEL CEO: BUY A MAC!

In a recent interview with the Wall Street Journal, Intel CEO Paul Otellini groused about the spyware infecting his daughter's PC (gee, where she's been surfing?!). Mr. Otellini, who is apparently a newb in such matters, said he spends approximately an hour each weekend cleaning the spyware off her PC. When asked if he thinks people should just buy a Mac instead, he quipped, "If you want to fix [the spyware problem] tomorrow, maybe you should buy something else."

NO MORE "MY" IN LONGHORN



In a move that has sent shockwaves through the computer industry, Microsoft recently announced it was dropping the "My" prefix from various folders in its upcoming Longhorn OS. The "My Documents" folder, for example, will simply be named "Documents" in the upcoming OS. Can we get a hallelujah?

CONGRESS OUTLAWS SPYWARE

Congress recently passed tough legislation against spyware, programs that are secretly installed on a user's PC and that report on computing activities, change a browser's start page, and muck up most Windows installations. Violators of the anti-spyware ordinance could face up to two years in jail and fines up to $3 million. Now that Congress has stepped in, we're confident the war on spyware will be just as successful as the war on drugs, the war on terror, or the war on Dennis Miller!

NEXT-GEN FIREFOX BROWSER APPEARS

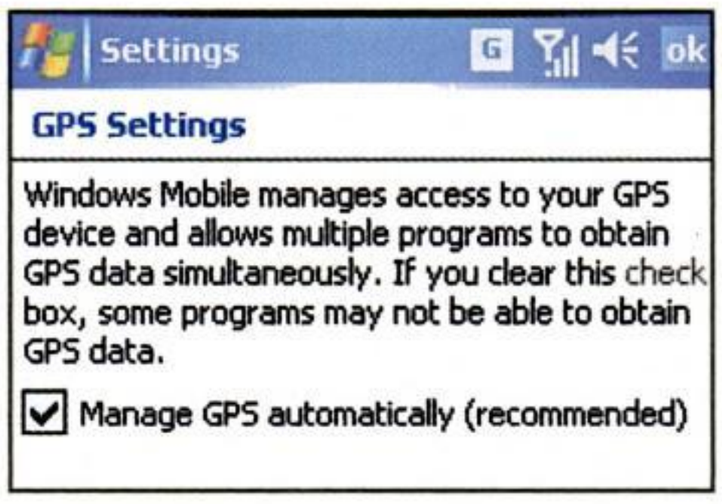
The folks at Mozilla have released the next-generation *Firefox* web browser for testing. Code-named Deer Park Alpha, the revamped browser sports cool new features for everyone from end users to web programmers. New features for home users include a "sanitize" function that lets you clean browser cache, cookies, history, and saved form information via a keyboard shortcut and a new "very experimental" session-navigating feature that should speed up going back or forward from page to page. If you're feeling frisky, you can check it out at **www.mozilla.org/projects/deerpark/releases/alpha1.html**.

Windows Mobile 5.0 Comes to PDAs and Smartphones

After years of maintaining separate operating systems for handhelds and smartphones, Microsoft has introduced Windows Mobile 5.0—formerly code-named Magneto—a single OS for both platforms that beefs up the mobile application suite and improves support for one-handed use.

That last part will appeal to smartphone users, who are often unable to use the stylus for navigation while driving. Windows Mobile 5.0 adds two programmable "soft" buttons to the bottom of the screen. You can use this option to launch your contact database, for example, and then scroll through contact information using your directional pad, dial a number with a double-click, and then end the call with another click—all without ever touching the pointy stick. Windows Mobile 5.0 also supports "persistent storage" that will prevent data loss in case of a complete battery discharge (this must be supported by your hardware as well).

Naturally, Windows Mobile 5.0 offers global support for landscape as well as portrait display.



Windows Mobile 5.0 features OS hooks that can access GPS and camera data.

Word Mobile, the replacement for *Pocket Word*, now supports tables and embedded images. *PowerPoint Mobile*—a new addition to the suite—doubles as a powerful sleep-aid. *Windows Media Player 10 Mobile* lets you synchronize music and video with your desktop machine and includes support for *Windows Media* DRM'd tracks from online services such as Napster-To-Go.

Windows Mobile 5.0 should come preinstalled with all newly minted smartphones and PDAs, but it's possible current PDA owners can upgrade; Dell, for instance, has already announced a software upgrade option for owners of the company's x50 family.

DisplayPort Cometh

The Video Electronics Standards Association (VESA) announced a unified digital interface standard that's supposed to cover the entire spectrum of computer display devices. Known as DisplayPort, the interface will be used to connect all common external displays including CRT, plasma, projection units, and LCDs, as well as internal displays, such as those found in notebook PCs and various handheld devices.

DisplayPort has the backing of industry biggies, including nVidia, Dell, HP, Molex, and Samsung. VESA expects a final proposal from the group by Q3 of this year, which means products equipped with the DisplayPort interface could ship as soon as early 2006.

VESA's web site (**www.vesa.org**) is short on specifics, but it does say, "the standard will have a high initial bandwidth and is designed to scale to even higher bandwidths to accommodate future display requirements." DisplayPort will offer a new, smaller connector to better suit the ever-shrinking formfactors of PCs and portable devices, and the single connector is capable of delivering both high-quality audio and video over a single cable. Sounds good.

Unfortunately, the DisplayPort interface will be content-protection ready. If deployed in a device, the mechanism would require certain permissions before protected content can be displayed. Though details are scarce at this time, we're inclined to assume the worst about any new DRM-related tech, so our feelings about the "new and improved" features DisplayPort offers are decidedly mixed.

We know the DisplayPort connector will be smaller than DVI; we hope it will also be easier than DVI when it comes to plugging the darn thing in.

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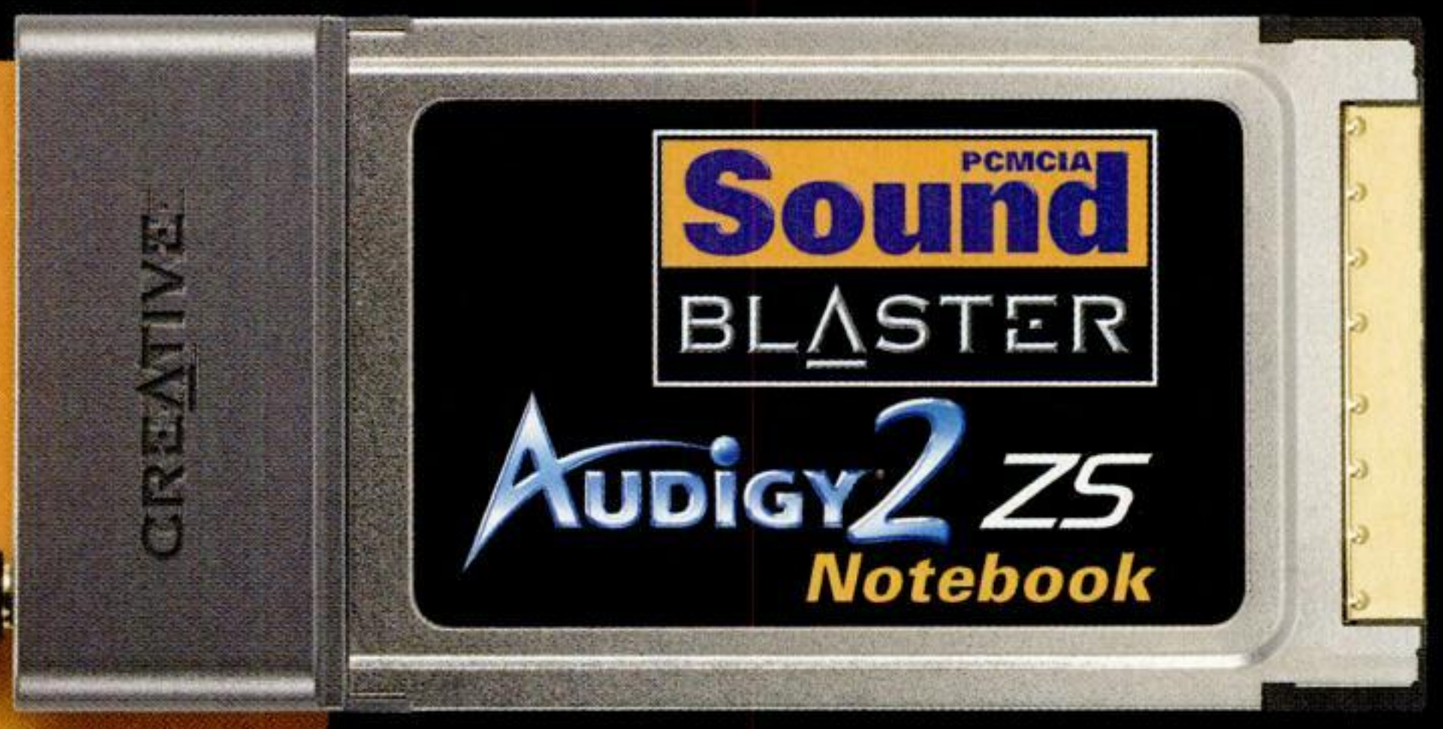

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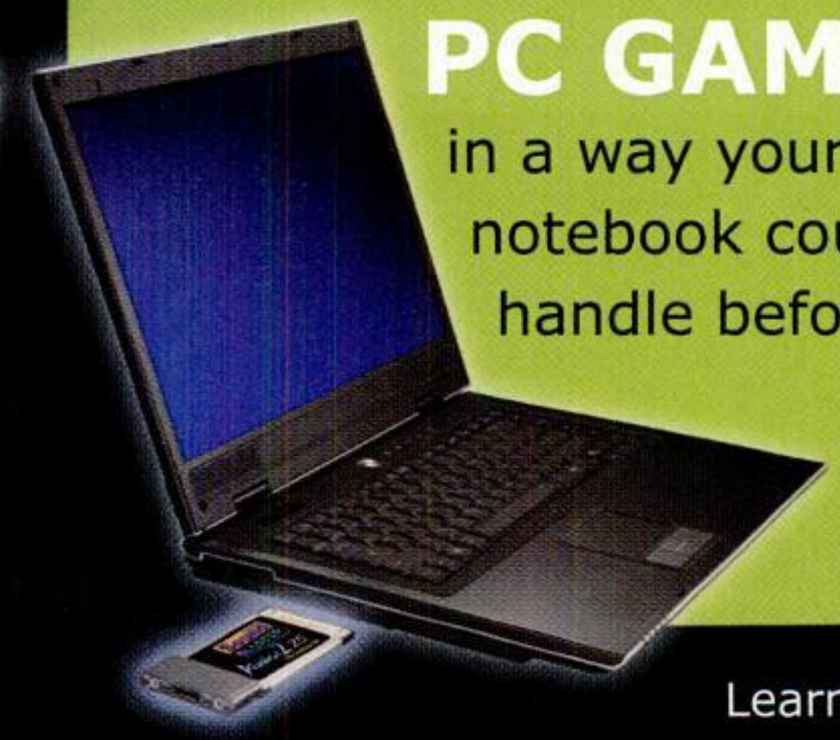

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GAME THEORY

Minifiguratively Speaking

***Lego Star Wars* seems more like the name of a clever QuickTime movie than an idea for a great game. There have been many Lego games, but few of them had enough substance to divert an adult for more than a few minutes. Indeed, *Lego Star Wars* is very clearly aimed at the grade-school set, with an absurdly forgiving design, goofy sense of humor, and obvious (albeit clever) logic problems.**

In spite of—or perhaps because of—its simplicity, I wound up loving the game. Not long ago, I spent a good deal of time with *Knights of the Old Republic II*, which is the very antithesis of *Lego Star Wars*. Deep, complex, adult, epic, long, challenging: It's all the things adults demand of advanced role-playing games. It submerges you in an unexplored corner of the Star Wars universe and let's you have at it. It is easily the best RPG I've laid my hands on in a year. But, *Lego Star Wars* is better.

No, it's not a better game, with better graphics, or a better design. For an adult, it's barely a game at all, since there's little real challenge to it. It's just a better experience. On the surface, it simply recreates scenes from the three prequels, with Lego minifigs and structures in an adventure game format with mild combat and puzzle solving. But Traveler's Tales has done this with a wry sense of humor, remarkable comic timing for any game (much less a blocky Lego game), and an indefinable sense of joy.

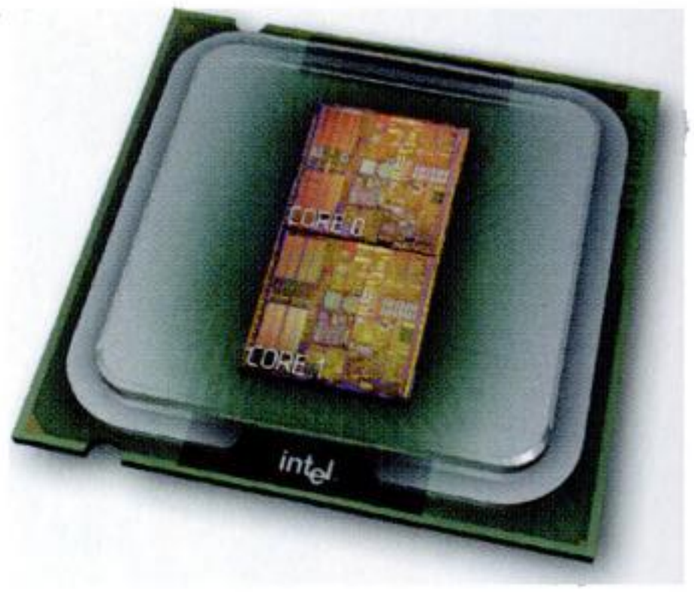
Its appeal almost certainly owes as much to the gamer as to the game. If you're a Lego fan (yo!) and a *Star Wars* fan (yo!), your reactions to *Lego Star Wars* are going to be considerably different than if you're neither, or only one or the other. There's weird magic at work in this game: It's like watching a beloved toy come to life and perform your favorite story at your command.

And once you get inside that goofy block world and those expressionless minifigs start acting out scenes, you realize they are performing with more talent and emotion than most of the live actors in the films. You leave the realm of pure gaming and enter a winking postmodern commentary on the *Star Wars* movies themselves. It both respects the vision of the source material and keeps a tongue-in-cheek tone, which is a minor miracle of craftsmanship that is too sharp and appealing to be left only to the kids.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

Episode III: Dual-Core Wars

AMD kills single-core A64, Intel launches budget dual-core



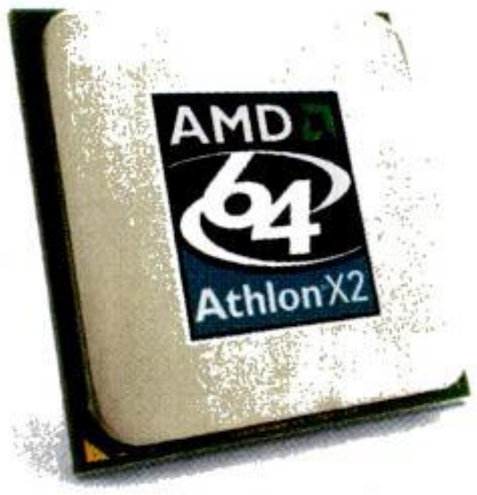
Intel's new dual-core Pentium D 820 looks mighty tempting for less than $300.

If you're put off at the thought of losing performance in today's applications for the sake of a dual-core experience, too bad. With their new product lineups public, AMD and Intel seem intent on making dual-core processors the default for PCs.

AMD PREPARES TO DUAL

AMD's new X2 lineup uses a similar strategy to that of its single-core procs: Chips will be differentiated by varying cache and clock speeds. The asinine, incomprehensible, numbered naming scheme will remain intact. The Athlon 64 X2 4800+ and 4600+ run at the same 2.4GHz speed—the main difference is L2 cache size. The X2 4800+ has 1MB of L2, while the X2 4600+ has 512KB. It's confusing, we know. The X2 processors all support dual-channel RAM up to DDR400, and of course feature on-die memory controllers.

AMD's plans are so big for dual-core that the company says the X2 will replace all its single-core Athlon 64 processors in the very near future. The company says it has no plans to introduce any higher-speed, single-core Athlon 64 chips going forward. The company will, however, continue to offer its budget Sempron processor in single-core trim as well, as its high-performance single-core Athlon 64 FX series.



AMD's Athlon 64 X2-series CPUs spell the demise of single-core Athlon 64 processors.

AS FOR INTEL...

Intel is also dead serious about dual-core procs. The company has fleshed out its Pentium D series with two truly affordable versions of the chip. The 3GHz Pentium D 830 gets you a dual-core proc for a little more than $300 while the Pentium D 820 is being sold for $241 (when either are purchased in quantities of 1,000). Even though the price reflects bulk purchases, many CPUs sell for less than wholesale once initial pent-up demand is serviced.

Like AMD, Intel plans to continue producing single-core procs at the very high end. To prove it, the company recently introduced a new 3.8GHz Pentium 4 CPU. The Pentium 4 670 doubles the cache of the 3.8GHz 570 version and adds 64-bit OS support. Unlike the 3.73GHz Pentium 4 Extreme Edition version, the P4 670 runs on an 800MHz bus, not the faster 1066MHz bus.

DUAL-CORE OFFERINGS FROM AMD AND INTEL, AT A GLANCE

CPU	Freq	L2 cache	FSB	Socket	Wholesale price
Athlon 64 X2 4800+	2.4GHz	1MB per core	N/A	S939	$1,001
Athlon 64 X2 4600+	2.4GHz	512KB per core	N/A	S939	$803
Athlon 64 X2 4400+	2.2GHz	1MB per core	N/A	S939	$571
Athlon 64 X2 4200+	2.2GHz	512KB per core	N/A	S939	$537
Pentium Extreme Edition 840	3.2GHz with Hyper-Threading	1MB per core	800MHz	LGA775	$999
Pentium D 840	3.2GHz	1MB per core	800MHz	LGA775	$530
Pentium D 830	3.0GHz	1MB per core	800MHz	LGA775	$316
Pentium D 820	2.8GHz	1MB per core	800MHz	LGA775	$241

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"Crucial Ballistix Tracer memory is a case modder's dream!"

—PCStats.com

Memory is memory, right? Inferior performance memory can wreak havoc on your system and can lead to software crashes, driver and operating system hiccups, and all sorts of trouble that, let's face it—you just can't tolerate. As an enthusiast, you need memory that consistently meets the performance demands of your system.

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Head2Head

A showdown between natural PC competitors

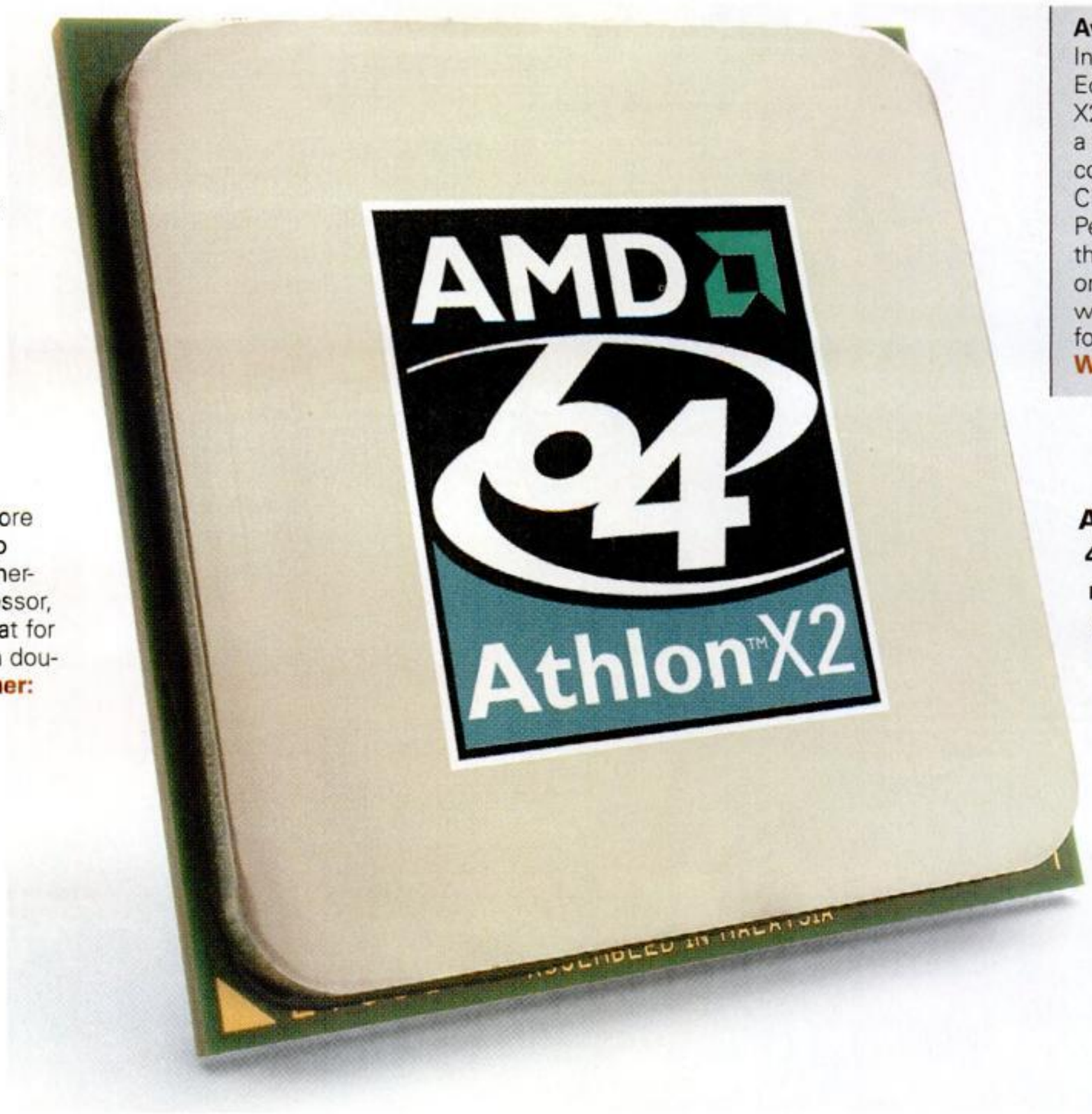
THIS MONTH: Dueling Dual Cores

Do you do only *one* thing at a time on your PC? If you're a single-task automaton, then strap on your blinders, skip this article, and wait a few months for the next showdown between Intel and AMD's fastest single-processor CPUs. If, on the other hand, you like to encode video while editing images, or you stack so many applications into the Taskbar that it looks like a game of *Tetris* gone bad, dual-core processors are made just for you. To find out which dual-core offering is best, we benched the hell out of dualies from Intel and AMD, and boy howdy, are the results interesting!

—GORDON MAH UNG

AMD ATHLON 64 X2 4800+

Infrastructure: There's good news in AMD land. If your mobo maker says your Socket 939 motherboard can run an Athlon 64 FX-55, it will also run a dual-core processor. Just drop in the proc and you're good to go. With plenty of Socket 939 boards available in both AGP and PCI-E trim, this one clearly goes to AMD. **Winner: Athlon X2**



Availability: Our theory is that Intel rushed the Pentium Extreme Edition out the door before the X2 came along, so it would have a brief moment in the sun before comparison between the two CPUs was possible. Indeed, Pentium Extreme Editions (and the Pentium D) can be found at online retailers for a pretty penny, which is more than we can say for the X2, at least for now. **Winner: Pentium EE**

Thermals: Despite having more transistors, AMD managed to keep its new X2 within the thermal profile of an FX-55 processor, at 110 watts. You can't say that for the dual-core Prescott, which doubles as a space heater. **Winner: Athlon X2**

AMD's Athlon 64 X2 4800+ drops into a majority of today's Socket 939 boards and is plenty fast in gaming and applications.

Features: The X2 gives you two cores, 64-bit OS support, No eXecute support to stop most buffer-overflow attacks, and even SSE3. Add in the on-die memory controller and you have just about every feature available today. Still, the Pentium Extreme Edition packs some special features all its own. **Winner: Tie**

Performance: While it's almost a tie in applications testing, in games the Athlon 64 X2 4800+ puts the hurt on the Pentium Extreme Edition in the ugliest way possible. Not that it was a surprise, as we've never been that impressed with the gaming performance of the 3.2GHz Pentium 4 Prescott, which is what the PEE is based on. **Winner: Athlon X2**

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INTEL PENTIUM EXTREME EDITION 840

Infrastructure: One of the biggest bone-head moves we've seen from Intel in a long time is to require a mobo with the new 955X or 945 chipset just to run dual core. Did you just buy a feature-packed 925XE motherboard in April? You're screwed. Put this checkmark in AMD's corner. **Winner: Athlon X2**

Performance: At 3.2GHz, the Pentium Extreme Edition's crankshaft just doesn't turn fast enough to give the Athlon 64 X2 4800+ much competition. Not a surprise. It's based on the Prescott 1MB core, which doesn't have the bandwidth or front-side bus speed of the newer 2MB Prescott cores. Besides, it's handicapped by its rather "low" clock speed of 3.2GHz. The benchmarks say it all. **Winner: Athlon X2**

Thermals: The good news is that even with the increased transistor count, the Pentium Extreme Edition doesn't put out twice the heat of a 3.2GHz P4 single core. The bad news is that it's still one hot sucker and could really benefit from the better thermals of BTX (which might explain why AMD is foot-dragging on the new formfactor). **Winner: Athlon X2**

Despite its four hardware threads, the Pentium Extreme Edition is hobbled by a low clock speed, insufficient cache, and its puny 800MHz FSB.

Features: The Pentium Extreme Edition is the only desktop processor to give you four virtual CPUs in one, thanks to the Hyper-Threaded nature of each core. Add in 64-bit OS support, SSE3, NX, and you have one feature-rich CPU. **Winner: Tie**

Availability: There's little to crow about, but Intel did ship its consumer dual-core processors first, and as we write this, you can pick up a PEE840 proc for a mere $1,200. Ouch. Still, first to ship is first to ship. **Winner: Pentium EE**

Dare to Compare: Dual Cores

MODEL NUMBER	AMD ATHLON 64 X2 4800+	INTEL PENTIUM EXTREME EDITION 840
Frequency	2.4GHz	3.2GHz
Microarchitecture	K8	Enhanced Netburst
Process	90 nanometer	90 nanometer
Die size	206mm^2	199mm^2
L2 cache	1MB	1MB
Transistor count	230 million	233 million
Interface	Socket 939	LGA775

Continued on next page➔

The Upshot

When all is said and done, it looks like AMD's Athy has the dual-core edge

How We Tested

To test the performance of the dualies, we used both new and old benchmarks. Older benchmarks such as *3DMark2001 SE* and *Quake III* stress the processor and the overall chipset and memory performance more than the graphics performance. Current and future gaming performance is gauged using *3DMark05, 3DMark03, Doom 3,* and *AquaMark 3.*

For applications, we used *Mathematica 5.1's* new benchmark to evaluate the processors' ability to solve several math formulas. The multi-threaded *DVD Shrink* is used to transcode an MPEG-2 movie stored on the hard drive. Because video transcoding is an increasingly popular task and a massive time suck, we also used Ahead's multi-threaded *Nero Recode* to transcode the same movie to an MPEG-4 format that will play on Sony's new PSP.

Our *Premiere Pro* and *Photoshop CS* tests use the same script as our standard system benchmarks. We used *MusicMatch 10* to convert a WAV file to high-quality MP3 format. The multi-threaded *Abbyy Fine Reader 7.0 Pro* is used to OCR a large document.

Finally, we threw in a multitasking test by running our *Photoshop CS* test at the same time that we used *DVD Shrink 3.2* to transcode an MPEG-2 movie. We intended to use *SYSmark2004* as well but the benchmark would not run on either dual-processor system.

Conclusion

In pimp-speak, the Athlon 64 X2 backhanded the Pentium Extreme Edition 840 in gaming and all but said, "Better have my money!" The Athlon 64 X2 simply stomped the PEE840 into the ground in the *3DMark* test, *Doom 3, Quake III,* and even *AquaMark*—traditionally a strong benchmark for the Pentium 4 architecture.

Only in the applications testing did the PEE840 recoup some dignity. We're not talking about piddly five percent victories either. We saw hefty 15 percent, 25 percent, and even 65 percent performance differences in the X2's favor. As in the past, it seems that the performance really depends on the application.

What we have are two very different dual-core stories. The Intel processor is really only suited for certain P4-optimized applications; it's not so hot for gaming. On the other hand, the AMD processor is pretty damned good for gaming and also smokes application benchmarks that favor greater memory bandwidth and a short-pipeline design. Because the X2 drops into 90 percent of the Athlon 64 motherboards on the market and the PEE840 demands a complete system overhaul, we're calling this one for the X2. The PEE840 could use more cache, a higher front-side bus frequency, and some more megahertz before it'll be able to take on AMD's dual. ■

Benchmarks	Athlon 64 X2 4800+	Pentium Extreme Edition 840	
Games			
AquaMark Overall	**72,460**	63,791	Winner is 13.6% faster
AquaMark GFX	**10,665**	9,597	Winner is 11.1% faster
AquaMark CPU	**11,295**	9,511	Winner is 18.8% faster
3DMark05 Overall	**5,568**	5,464	Winner is 1.9% faster
3DMark05 CPU	**6,302**	6,006	Winner is 4.9% faster
3DMark03 Overall	**13,181**	12,782	Winner is 3.1% faster
3DMark03 CPU	**1,298**	975	Winner is 33.1% faster
3DMark2001 SE	**25,538**	19,991	Winner is 27.7% faster
Quake III (fps)	**475**	378	Winner is 25.7% faster
Doom 3 10x7 HQ (fps)	**112.5**	90	Winner is 25.0% faster
Applications			
Mathematica 5.1 (sec.)	**29.1**	36.5	Winner is 25% faster
DVD Shrink 3.2 DVD transcode (sec.)	526	**485**	Winner is 8.5% faster
Nero Recode PSP transcode (sec.)	**1200**	1440	Winner is 16.7% faster
Photoshop CS (sec.)	**301**	355	Winner is 18% faster
Premiere Pro (sec.)	606	**507**	Winner is 19.5% faster
MusicMatch 10 (sec.)	**256**	275	Winner is 19.5% faster
Abbyy Fine Reader 7.0 Pro (sec.)	310	**186**	Winner is 66.7% faster
Photoshop CS w/ DVD Shrink (sec.)	**542**	551	Winner is 1.7% faster
DVD Shrink w/ Photoshop CS (sec.)	727	**616**	Winner is 18% faster

Best scores are bolded. Test configuration hardware: Athlon 64 X2: 1GB DDR400, GeForce 6800 Ultra, 160GB Seagate 7200.7. Pentium Extreme Edition: 1GB DDR2/667, GeForce 6800 Ultra, 160GB Seagate 7200.7.

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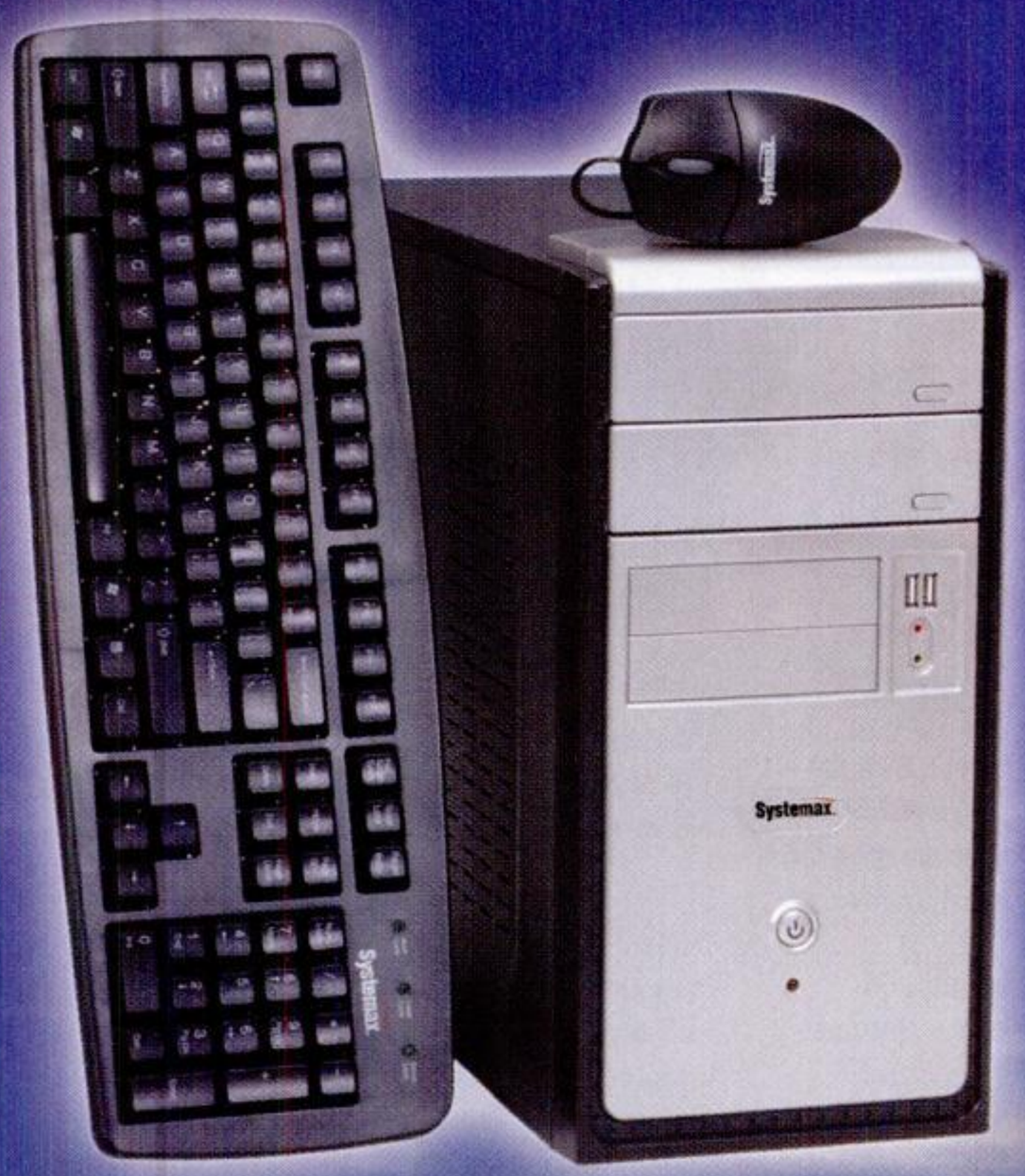

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WatchDog

Say hello to Pinky, WatchDog of the Month

Maximum PC takes a bite out of bad gear

THIS MONTH: The WatchDog goes after...

>D-Link >Counterfeit Windows XP >Motherboard Warranties >NeoScripter

D-Link Eats Its Words

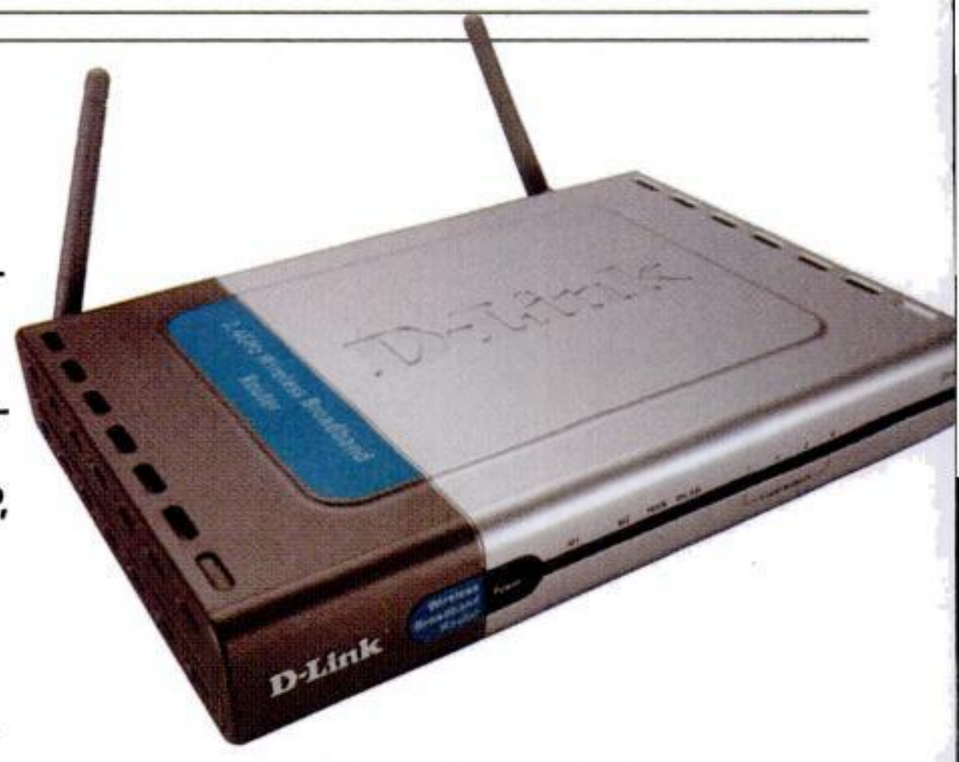
D-Link has settled a class-action lawsuit that alleged the company's routers weren't able to meet the marketing fluff touted on the packaging. The pair of suits, filed in both San Francisco and Los Angeles, claimed D-Link's (as well as other wireless hardware companies') advertising was misleading. The suit argued that the products were incapable of sending user data at the 11Mb/s or 22Mb/s rates published on the product boxes. Any networking tech knows that this is because the wireless error-correction protocols of Wi-Fi eat up some bandwidth. So while the wireless products can indeed send, say, 11Mb/s of data, not all of it is the user's data. If that sounds a little like suing a hard drive maker because a SATA device can't hit the 150MB/s data rate of the interface, the Dog tends to agree.

Still, is it right for wireless-equipment makers to tout 22Mb/s when the routers can't hit that with a good tail wind? To use our hard drive analogy again, wouldn't that be like advertising a single drive as a 150MB/s HD? There's no easy answer here, but if the only thing that results from the suit are more realistic advertised figures, that'll be a good thing.

In settling the suit, D-Link did not admit any wrongdoing, and a spokesman said the company has always felt the litigation was a nuisance suit, so it settled to move on. In D-Link's defense, even one of the original suits admits that the packaging says speeds are theoretical.

As part of the settlement, D-Link will give those in the class a 15 percent discount on additional D-Link hardware. To qualify, consumers must have purchased product between Dec. 1, 1999, and March 31, 2005. Qualifying products include the DI-624, DWL-2000AP, DWL-G520, DI-824VUP, DWL-2100AP, DWL-G650, DWL-G810, DWL-G800AP, DWL-G132, DWL-2100AP/LU, DWL-G820, DI-524, DWL-G510, DP-G310, DSM-320, DWL-G630, DWL-G120, DPG-2000W, DWL-G700AP, DWL-G730AP, DWL-G650X, DWL-G122, DP-G321, DCS-3220G, DCS-5300G, DI-784, DWL-AG660, DWL-7100AP, DWL-AG530, DWL-7200AP, DI-774, DWL-AG650, DWL-7000AP, DWL-AG520, DWL-2700AP, DWL-1700AP, DWL-1750, DWL-1000AP+, DWL-2200AP, DWL-2210AP, DI-514, DWL-122, DWL-520, DCF-660W, DWL-810, DP-311U, DCS-900W, DI-713P, DWL-700AP, DWL-650, DWL-120, DWL-650H, DP-311P, DP-313, DCS-1000W, DWL-900AP, DI-714, DCF-650W, DWL-500, DWL-1000AP, DI-713, DI-711, DCF-650W/K, DVC-1100, DCS-2100+, DI-714P+, DWL-810+, DWL-650+, DWL-120+, DCS-5300W, DWL-800AP+, DI-614+, DWL-900AP+, DWL-520+, DI-754, DWL-6000AP, DWL-AB650, DWL-A650, DI-764, DWL-5000AP, DWL-AB520, and DWL-A520. Claims must be filed by November 13, 2005, and they must include the product's serial number.

In addition to the discount, D-Link will also donate $25,000 in products to the National Association for the Exchange of Industrial Resources, which distributes donated products to nonprofits and schools. D-Link will also pay $850,000 to the attorneys who filed the suit, and will put disclaimers on its boxes, warning that "actual data throughput will vary." More information on the settlement is available at www.d-link-resolution.net.



D-Link has settled a suit that claimed that it and other wireless-hardware makers misrepresented bandwidth figures.

> *"D-LINK WILL PUT DISCLAIMERS ON ITS BOXES, WARNING THAT 'ACTUAL DATA THROUGHPUT WILL VARY.'"*

Genuine Counterfeit Amnesty

Does something seem hinky about the copy of Windows XP Pro that came with your computer? In an effort to root out computer shops that are loading new PCs with counterfeit copies of the Windows OS, Microsoft is offering an amnesty period to consumers who report they've received the forged software.

Under the Windows Genuine Advantage program, consumers who unknowingly purchase counterfeit copies of Windows XP Pro could receive a free license and/or Windows XP Pro disc. What's a counterfeit OS? The forgeries are amazingly detailed replicas of the original OS disc and materials. Usually the counterfeit copies use a volume license-key version of Windows XP Pro so as not to trigger the activation that's included with the retail copy of the OS. If you're wondering what's so bad about a counterfeit, consider what else might be piggybacking on the disc. A counterfeit disc made in a smoke-filled back room might contain trojans or viruses that would reappear on your machine with every fresh install.

Microsoft says that for consumers to qualify, they must first use the company's authentication script, which prompts the consumer to download a manual update from Microsoft's web site using Internet Explorer. The update should verify the product key. If the version is found to be a counterfeit, consumers must submit a proof of purchase, their counterfeit CD, and a completed counterfeit report. Microsoft will then try to electronically validate that the counterfeit install is not compromised in any way, and issue the consumer a valid product key. The company will also issue a new CD, which the consumer should use to reinstall the OS, to be safe. Users who do not qualify for the free copy (those who unwittingly purchased a counterfeit copy of the OS from a seemingly legitimate website) might be able to purchase XP Pro for a slight discount of $150. For more information visit www.microsoft.com/genuine/.

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Mobo Warranties Conspiracy

DEAR DOG: While on the hunt for a good motherboard, I've found it extremely difficult to find warranty information for most boards. It almost seems like there's not a mainboard maker on the planet who makes warranty information readily available.

A lot of suppliers, such as Tigerdirect.com, provide the information, but why isn't this information on the manufacturer's website, and if it is, why isn't it easy to find? It's as if the manufacturers have something to hide.

—BRIAN

Denied! If your new computer came with a counterfeit copy of Windows XP Pro, Microsoft might give you a free copy if you narc on your system builder.

THE DOG RESPONDS: There's a conspiracy, Brian—one tied directly to cookies that were installed as part of the motherboard-driver installation. If you browse to the motherboard maker's web site using *Firefox*, you'll see the warranty info. If you use *Internet Explorer* you won't. Just kidding!

The Dog cruised a few motherboard sites (using *Internet Explorer*, no less) and found that some manufacturers make warranty information as plain as day. Others, however, require you to dig for it; and still others just don't seem to have it posted at all.

Is there a conspiracy? No way, says a spokesman for Tyan motherboards. In fact, on Tyan's web site, warranty info is listed as a direct link under Products. So why is it so difficult on other sites?

Because the warranties are in effect regardless of whether you find the info, the Dog suspects the main culprit is poor web design, as well as the multinational nature of mobo companies. Most of the web sites serve not just an American audience but consumers from around the world. The warranties for some countries might be completely different from those offered to the U.S., so it's possible the warranties are purposely not emphasized to make web design simpler.

If a motherboard's warranty is important to you, you should do as much research as possible before buying a board, as the policies vary. Some companies, for example, tie a board's warranty date to the date of its manufacture. If the board sits on a shelf for six months, it's up to the retailer to make up the difference, according to one company. Other vendors will not honor a warranty if the serial number (usually just a sticker) has been removed from the motherboard. Finally, some warranties vary by motherboard class. A workstation or server motherboard might have a much longer warranty than a desktop board. Here's a quick run down of what the Dog could find. ■

"IF WARRANTIES ON MOTHERBOARDS ARE IMPORTANT TO YOU, YOU SHOULD DO AS MUCH RESEARCH AS POSSIBLE BEFORE BUYING A BOARD, AS POLICIES VARY."

MOTHERBOARD WARRANTIES COMPARED	
Abit	Three years parts and labor
Aopen	Three years parts and labor
Asus	Three years parts and labor
DFI	Three years parts and labor
Iwill	Three years workstation, one year desktop
Gigabyte	Three years parts, two years labor
MSI	Three years parts, two years labor
Soyo	One year parts and labor
Tyan	Three years parts and labor

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maximumpc.com**. The Dog promises to get to as many letters as possible, but only has four paws to work with.

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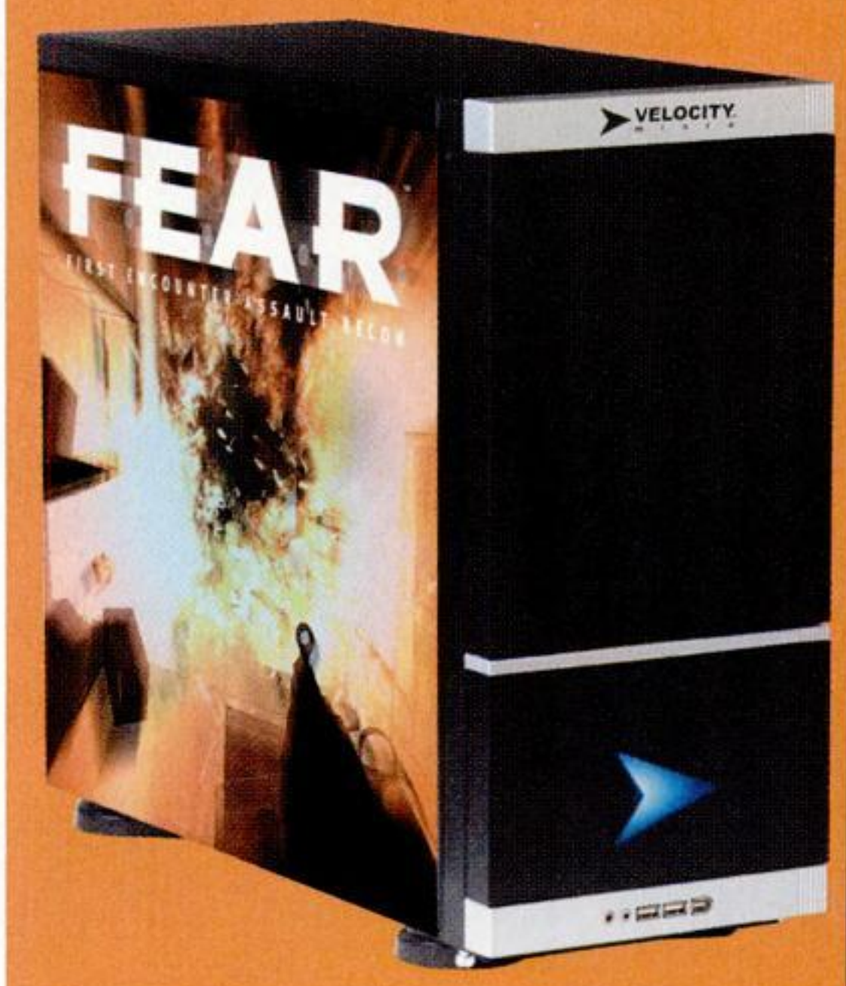

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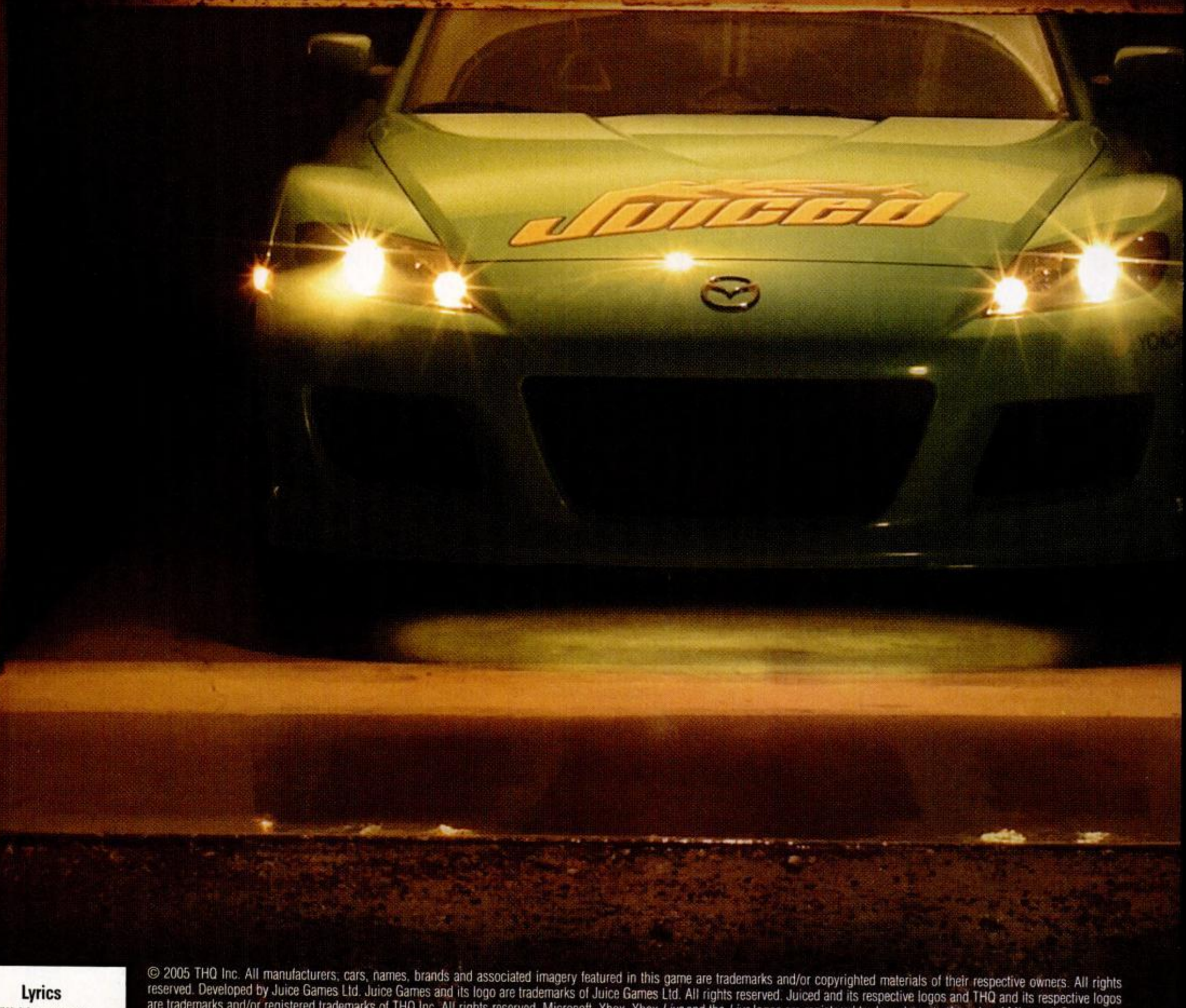

TEEN
T
CONTENT RATED BY ESRB

Lyrics
Mild Language
Simulated Gambling

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23 COMPUTING CURES!

Don't let spyware and viruses put your computer in the sick house! We review the best (and worst) utility software, and then show you exactly how to use the right products to defend your PC against Internet rogues

BY CHRISTOPHER NULL

It's not paranoia if they're really out to get you. And judging from the onslaught of script kiddies, unemployed Bulgarians cranking out viruses dedicated to strippers, and the seemingly unlimited flow of free money from Nigeria's ousted politicians, *they are out to get you.*

It's a wild and woolly Internet out there, but strong protection is just an app or two away. The apps you choose to protect your machine can mean the difference between sleeping easy and having your PC turned into a spam-sending zombie, with each message offering a Pope John Paul II commemorative coin for sale.

We're here to help you regain control of your computer! We collected the most popular security and utility programs on the market, then tested to see how well they really work in an environment under siege from spyware, spam, viruses, and hackers—like the one your computer faces every single day. We also ferreted out the best disk repair utilities, and the very best in freeware of all shapes and sizes. After all, why should you shell out your hard-earned cash for commercial products if there's a free alternative!

Don't be complacent! Just because your computer seems OK doesn't mean it's not teaming with spyware and trojans. Even if you *think* your computer is safe today—this is one story you can't afford to skip.

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THE ROGUES GALLERY

Everyone knows that the bogeyman is real, and that he lives on the Internet. He sits in his Hungarian ice shanty waiting for you to click the wrong e-mail attachment. But there are many different kinds of threats online, and if you're going to build a good defensive strategy, you'll need to know what the threats are, how they attack your machine, and how they differ from each other.

VIRUSES/TROJAN HORSES

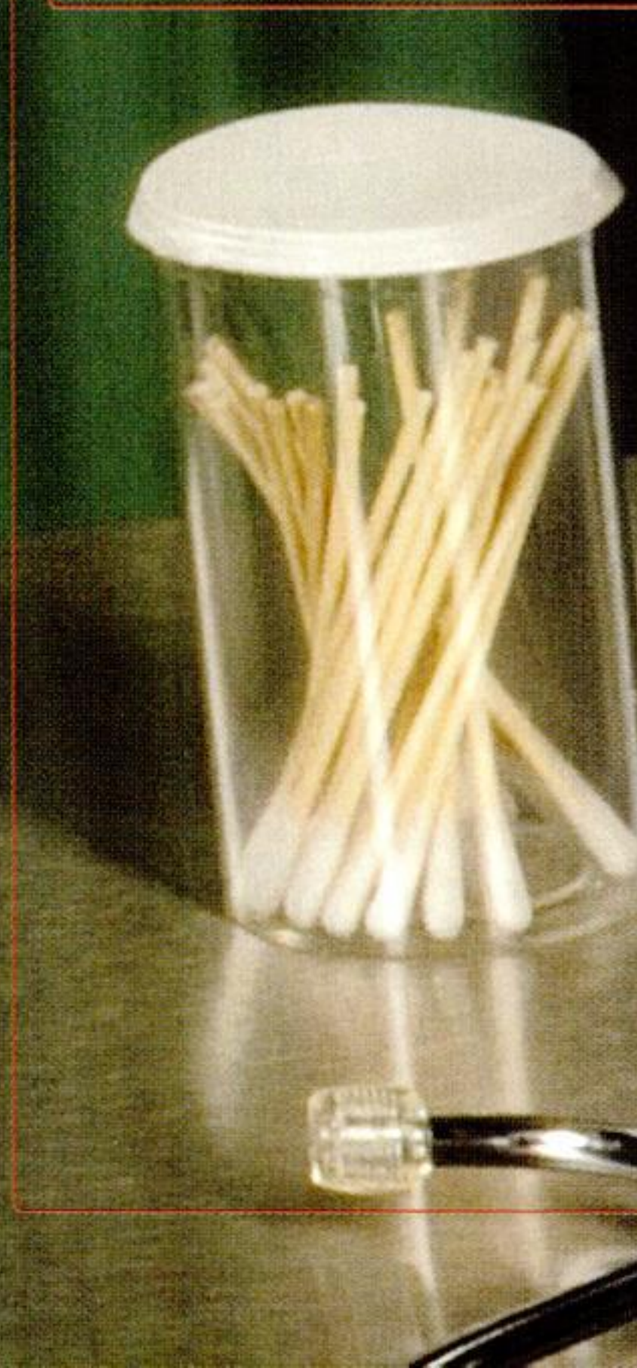
This age-old menace predates the Internet, actually originating back in 1983 when pioneering young tinkerers thought it'd be a clever idea to hijack a VAX with a few lines of code. Mission accomplished: Today some 70,000 to 80,000 viruses, trojans, and related threats exist, almost all of which are targeted at Windows PCs. The most innocuous among them display friendly messages on your monitor. The worst (stand-alone programs known as trojans) will e-mail files from your hard drive at random, corrupt files, log your keystrokes, annihilate your hard drive, and even install other malicious programs. These threats are transmitted via everything from cute animated-GIF e-mails to self-propagating worms.

INTERNET ATTACKS

A few years ago you had to install an e-mail client or bring in a foreign CD or floppy to open your computer to attack. Infections often required clicking an executable. Man, those were the days! Today, all you need to do is plug your PC into the Internet via an unsecured Ethernet, dialup, or Wi-Fi connection to be at risk. Automated network scanners scour every IP address on the Internet for vulnerable PCs: When they find one, they install trojans and other software, typically turning the afflicted PC into a zombie that will participate in denial-of-service (DOS) attacks or send mountains of spam—often without the user ever knowing. Connect an unprotected PC directly to the Internet and your computer will be compromised within a matter of minutes.

SPAM

Formerly just an advertising-driven nuisance that promised to enrich our lives with stock tips and herbal Viagra, today the spam business has grown into a multi-million-dollar industry with far more grandiose and nefarious ends. Thousands of people have fallen prey to the so-called "Nigerian Fraud," wherein purported African nationals beg for help (typically in all caps) moving funds from their country to yours, when in fact they just drain your bank account. Phishing attacks, where shady characters try to get passwords to your bank and credit card accounts, have become so sophisticated that even experts have trouble picking out genuine bank and ISP messages from fraudulent ones. And spam, of course, is a major vehicle for the delivery of viruses, trojans, and other spyware. With no end in sight, some estimates peg spam at greater than 70 percent of all e-mail traffic.



SPYWARE/ADWARE

The latest player to enter the junkware game is spyware, which is exactly what it sounds like: a program that reports back to its evil masters exactly who you are, what you do with your computer, and worse. The most benign spyware apps (known as adware) simply use your demographic information to deluge you with "targeted" advertising. It's annoying, but at least it's not malicious. The worst of these apps can function as keystroke loggers, which capture your passwords, credit card numbers, mother's maiden name, and more, then surreptitiously send all that data back to the bad guys, who can then use it to steal your identity and your *Maximum PC* subscription. Thousands of spyware apps now exist; one estimate claims that 88 percent of all PCs have at least one form of spyware installed.

SYSTEM SLOWDOWNS

Even if you're protected against all of the above external menaces, Windows' own self-loathing has a tendency to sap performance over time. A bloated Registry, fragmented hard drives, and endless remnants of long-forgotten and half-uninstalled software will eventually clog your system so badly that you'll probably feel a clear-cut wipe-and-reinstall is in order. Disk fragmentation alone can account for an overall performance hit of up to 50 percent of your PC's optimal speed. *Eek!*

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ANTIVIRUS SOFTWARE

Antivirus software is the critical first stop to ensure that electronic nasties don't find their way onto your system, and like antibiotics, good antivirus software should be able to detect and neutralize a broad range of bugs. It should also integrate with your e-mail applications and give your system routine checkups with scheduled full-system scans.

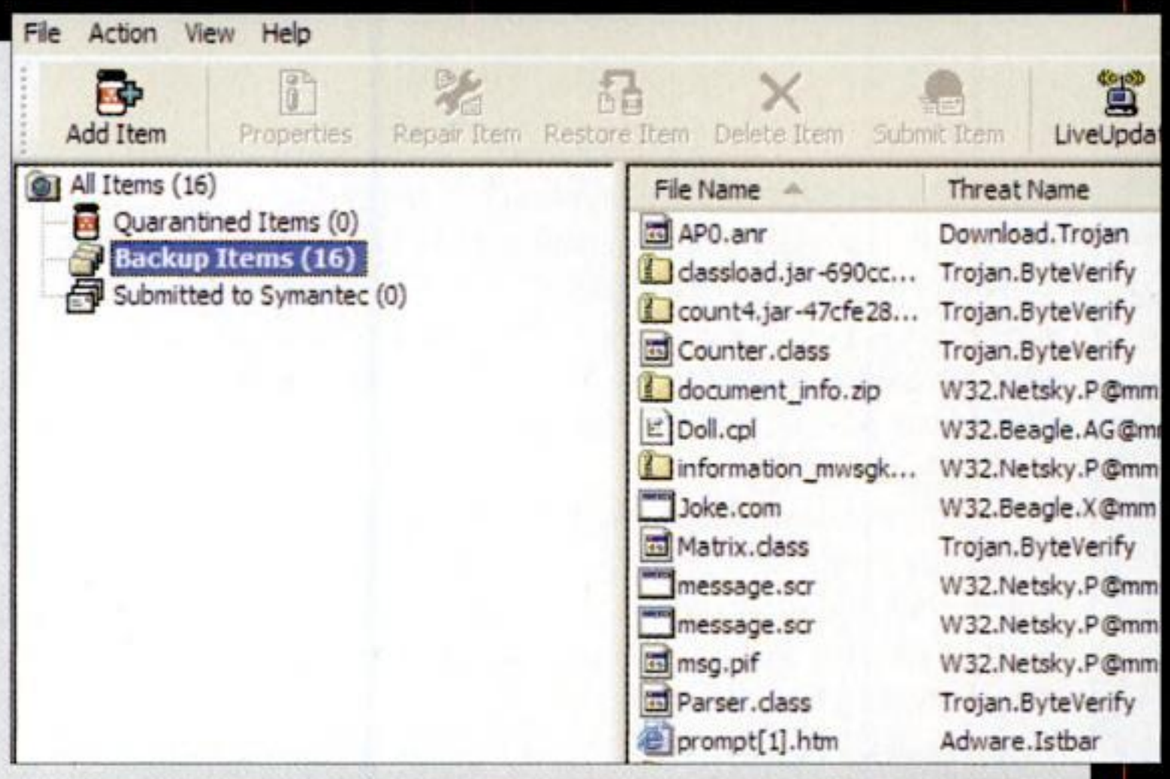
SYMANTEC NORTON ANTIVIRUS 2005

Like Christina Aguilera, *Norton Antivirus* gets a minor modification every 12 months in order to keep from passing into irrelevance. While the application's basic operation and interface haven't changed in several years, *Norton's* capabilities keep growing, which may not be a good thing—installation and updates now take an eternity.

NAV 2005 took just nine minutes to plow through the 40,000 files on our test system, making it the fastest scanner in our roundup. Unfortunately, it was unable to clean or delete a pair of infected files that it found. *Norton's* biggest advantage over other scanners is the helpful amount of detail it offers on infected and suspicious files, so we didn't feel too bad that a remnant of an old virus was left on our system.

Norton is more troubling when it comes to running updates: *LiveUpdate* will fetch virus definitions automatically, but it requires user intervention to patch the application itself.

MAXIMUM PC VERDICT 7 $50, www.symantec.com



***Norton* quarantines detritus in an easy-to-scan lockbox.**

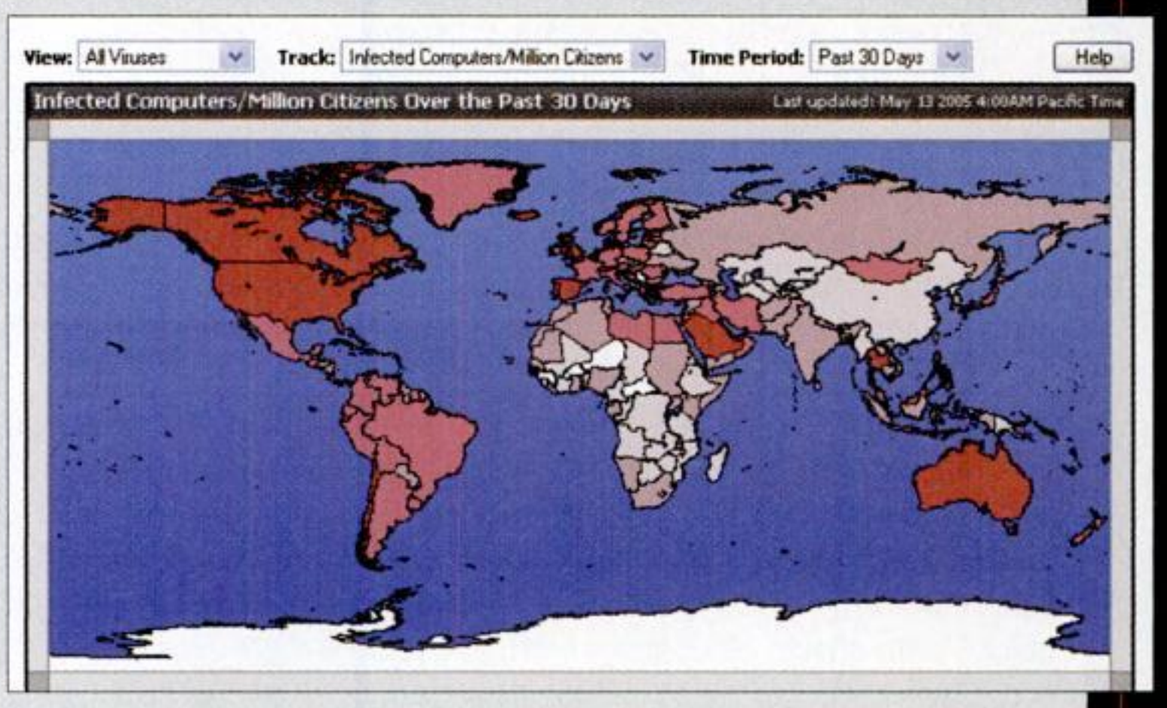
MCAFEE VIRUSSCAN 2005

Beaten up by Symantec on the antivirus playground, McAfee *VirusScan* still isn't up to the competition. It's dog slow, taking longer to scan our system (26 minutes) than the other two apps combined. When it finished, *VirusScan* found no viruses and flagged seven "potentially unwanted programs," although we had intentionally seeded several viruses on the system. As for those potentially "unwanted programs," the application didn't give us enough information to know if we really wanted them or not.

Dialogue boxes are small and hard to read (and not resizable), and overall the program seems more intent on upselling you to other McAfee security products than in actually protecting you from genuine virus threats. And an extra memory-resident program, the *Security Center,* rides along with every McAfee product you install (although you can uninstall it afterwards).

On top of all this, *VirusScan* crashed during our first attempt at installation. Its intrusiveness, pokey slowness, and overall ineptitude made us feel like we needed an application to protect us from *VirusScan,* not viruses.

MAXIMUM PC VERDICT 5 $40, us.mcafee.com



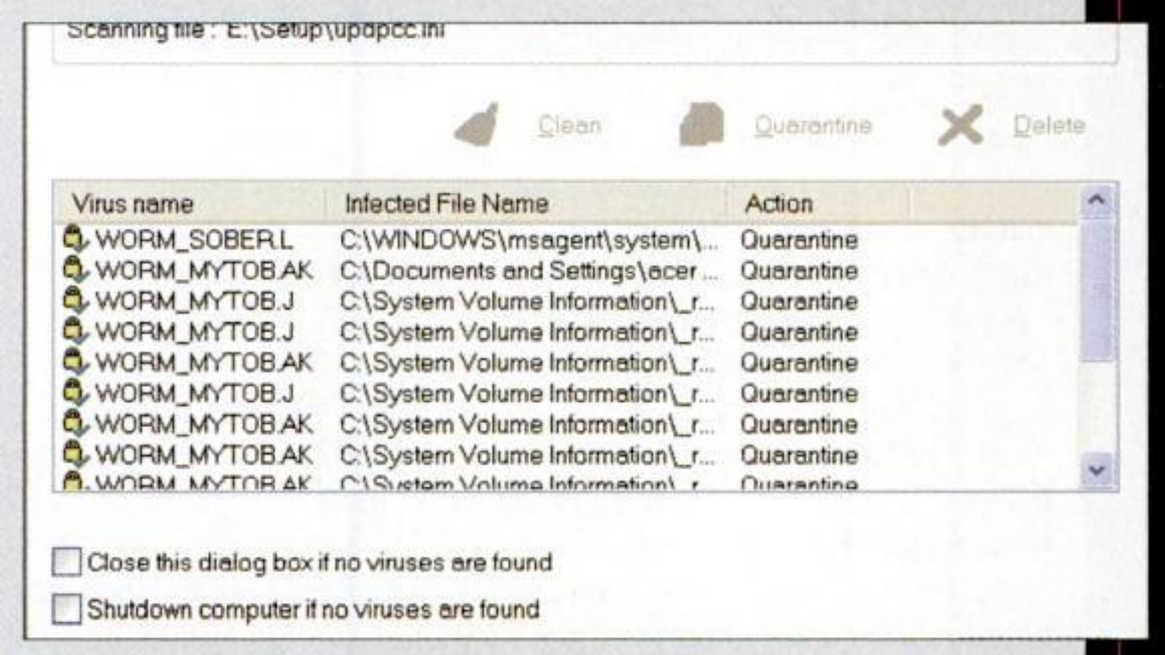
***Oooh,* a pretty map shows the location of recent virus outbreaks! And this helps us how?**

TREND MICRO PC-CILLIN INTERNET SECURITY 2005

Trend Micro's *PC-cillin* might look like it hasn't been updated since the days of Windows 3.1, but under the hood it's remarkablly sophisticated. *PC-cillin* installs easily and updates itself promptly with the latest virus definitions. One advantage of the old-school interface is that it's easy to find the commands to scan your hard drive or set e-mail-scanning options. *PC-cillin* doesn't waste your time, either; it ripped through our test system in just 11 minutes, nailing every single virus and virus fragment we seeded on the system.

On the downside, *PC-cillin* offers minimal data about the viruses it uncovers, but we figured that anything beginning with "WORM" was fair game for ejection from our PC. Still, we'd appreciate more information about each infection. We doubt you'll even need the company's free phone support: *PC-cillin* is simple but extremely effective.

MAXIMUM PC VERDICT 8 $50, trendmicro.com



If you want to run your scans before signing off, *PC-cillin* will shut down for you after it's all done.

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FIREWALLS

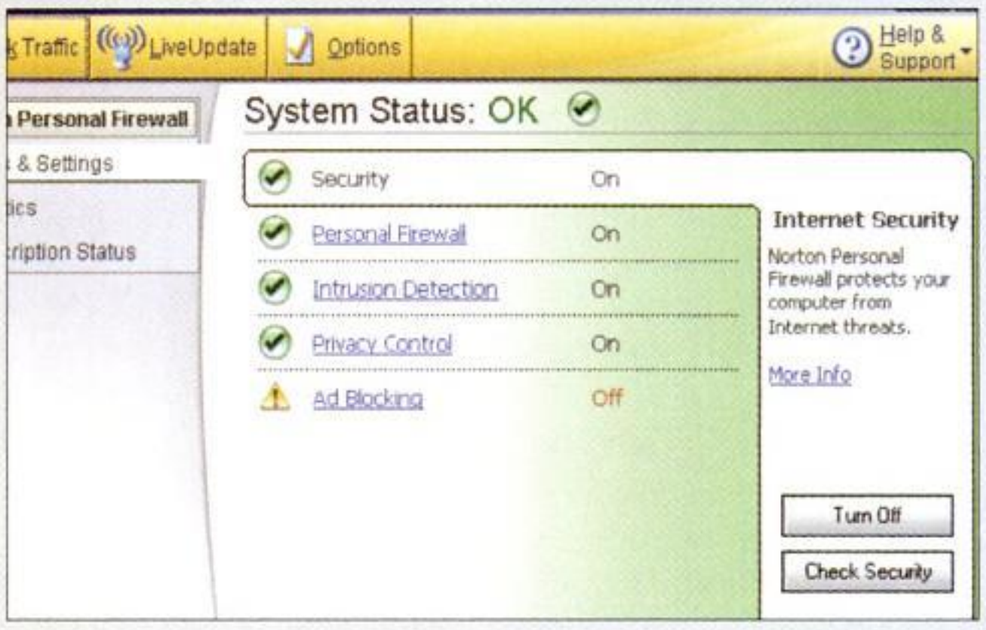
Although it's more convenient to run a firewall on your router than on each individual PC, software firewalls are a must if you connect your PC directly to the Internet. Don't rely on the pitiful Windows firewall—turn it off and install one of these third-party apps instead.

SYMANTEC NORTON PERSONAL FIREWALL 2005

Norton Personal Firewall is a brawny PC bouncer: We couldn't crack its defenses with any of our underhanded schemes. Even better: When *NPF* detects that a game or other app is trying to use a blocked TCP port, it asks you whether you want to open a port for it to use. No need to manually configure access for the ports the hard way. That *rocks*. Still, if you're a sucker and want to write custom rules for an app that *NPF* doesn't already recognize, *NPF* makes it relatively easy to do that, too.

Norton Personal Firewall 2005, like most *NPF* products, takes an eternity to install, followed by several additional eternities to patch the firewall via LiveUpdate, which in turn requires at least two iterations, reboots, and so on. Eventually you'll be permitted to actually use the product, and its default setup will be fine for most users who aren't doing something funky on odd TCP ports.

MAXIMUM PC VERDICT 7 $50, www.symantec.com



You can get your security status at a glance, but chances are you'll never even need to come this far.

ZONE LABS ZONEALARM PRO 5.5

MAXIMUM PC KICK ASS PRODUCT

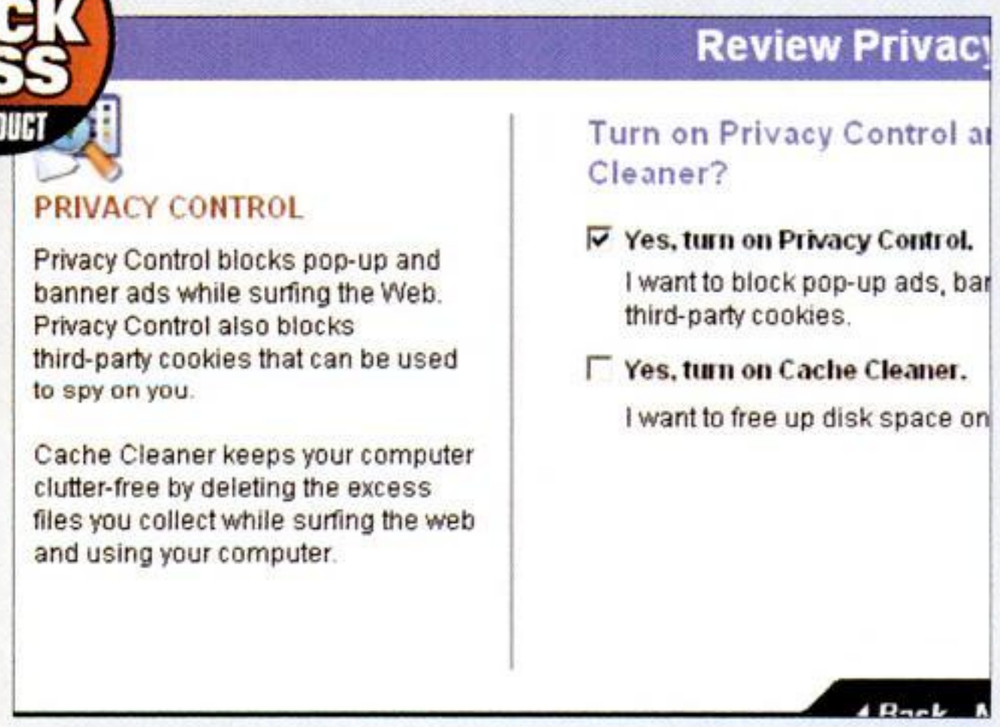
Folks, this is the Cadillac of firewalls. The Super Premium with Techron. The Royale with cheese. It's got everything to protect you from Internet hoods but a loaded revolver.

ZoneAlarm Pro has evolved into a sophisticated tool for novices and experts alike. Security newbs will be thrilled with the visual tutorial that greets new installations. Experts will find access to advanced rule-making features that make it easy to open additional ports with a single click.

While *ZoneAlarm* shines as a rank-and-file firewall, it's in the extras that the program practically goes supernova. Among the myriad bonus features are a privacy filter that blocks pop-ups, cookies, and banner ads; a plugin that blocks dangerous attachments from your e-mail application; and a System Tray icon that indicates how much traffic is going in and out of your machine—which can be useful at providing a quick "reality check" about how much traffic your PC ought to be generating.

Whether you stick with the default configuration or go crazy with the options, you won't find a better firewall than *ZoneAlarm Pro.*

MAXIMUM PC VERDICT 9 $50, www.zonelabs.com



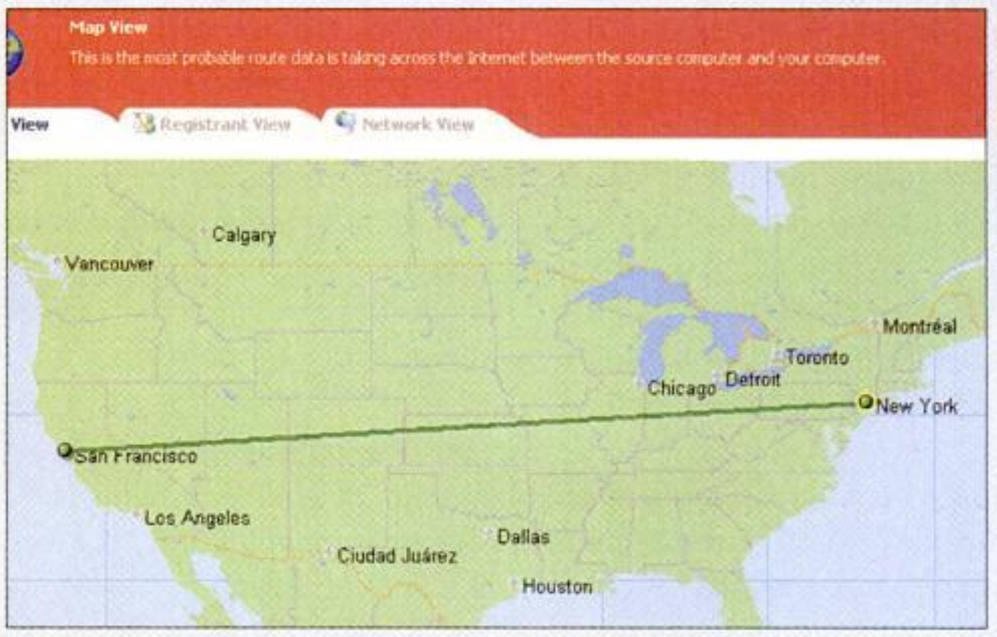
One of many bonus features in *ZoneAlarm* is a privacy filter that blocks pop-ups, cookies, and banner ads.

NETWORK ASSOCIATES MCAFEE PERSONAL FIREWALL PLUS 6.0

It's more than just a tediously long name—*McAfee Personal Firewall Plus 6.0* is also strong medicine against network cooties. *MPFP* installs easily and quickly, and its default rules are completely adequate for protecting you from external threats—it was able to stop every attack we threw at it without breaking a sweat. We did, however, break a sweat trying to make simple configuration changes through the clunky interface.

MPFP provides more detail about each attack than any of the other firewalls. The Inbound Events screen shows not only the source IP of each attack, but also a description of the attack, domain registration information for the attacker, and even where the attacker lives. The bad news is that all this detail is pretty much useless unless you want to arm yourself Bernie Goetz-style and bust down the doors of oblivious people with infected zombie PCs.

MAXIMUM PC VERDICT 6 $40, http://us.mcafee.com



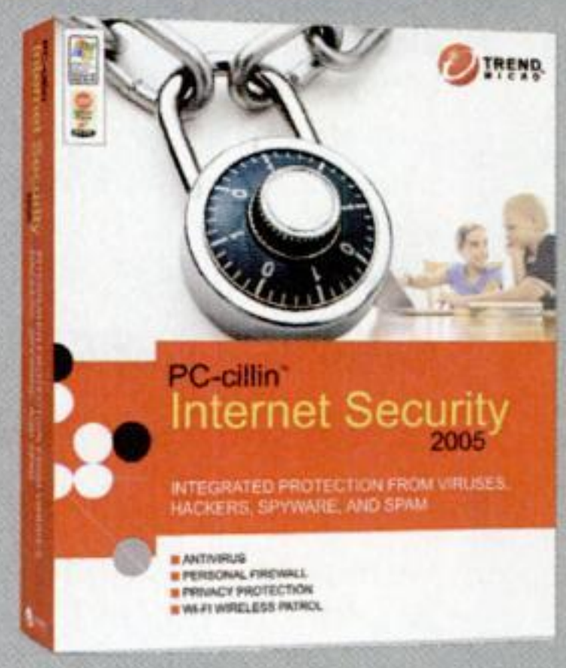
Track your attacker: How hard can it be to find a culprit in New York City?

"MY SECURITY SOFTWARE IS SLOWING ME DOWN."

"Let's be clear: Trend Micro PC-cillin Internet Security 2005 is the best Internet protection bundle currently on the market--period."

- CNET.com, October 2004

Now that you've purchased security software, have you sacrificed speed? Trend Micro™ PC-cillin™ Internet Security 2005 gives you the protection you need without slowing down your computer. And you get FREE phone support. Security. Speed. Support. With Trend Micro™, you don't sacrifice a thing.



c|net Editors' Choice NOV 2004

PC WORLD ★★★★½ February 2005

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SPAM KILLERS

Spam isn't just a nuisance, it's also an increasingly dangerous problem that, if treated improperly, can introduce all manner of ickies to your PC—or separate you from your hard-earned allowance. And remember that a good anti-spam tool has to integrate seamlessly with your messaging weapon of choice, so you'll need to check before you buy to make sure your app is supported.

SYMANTEC NORTON ANTISPAM 2005

This is a mess of a program that does little to stem the tide of spam. Taking its cue from *Norton AntiVirus, AntiSpam* relies on spam lists and definition files from Symantec, which are updated periodically through the LiveUpdate system. *AntiSpam* can also filter out certain languages at your choosing, and a slider lets you control the overall sensitivity to spam (set it higher, and you'll find more legit e-mail in your quarantine folder).

Training the system over time, we ultimately got *AntiSpam* to catch about 85 percent of spam messages, 10 percent of which were false positives—even though the senders were on our whitelist! *NA* integrates poorly with *Outlook*, which pops-up a plugin warning every time you flag an e-mail as spam. Approving the plugin isn't permanent. Every 10 minutes you have to reapprove it. Dealing with these security pop-ups over a full day of e-mailing is only marginally less aggravating than dealing with the actual spam. LiveUpdate didn't fix this, either. Overall, this app just isn't worth the trouble.

MAXIMUM PC VERDICT 4 $40, www.symantec.com

Spam statistics are interesting as an intellectual curiosity, but distressing on a philosophical level.

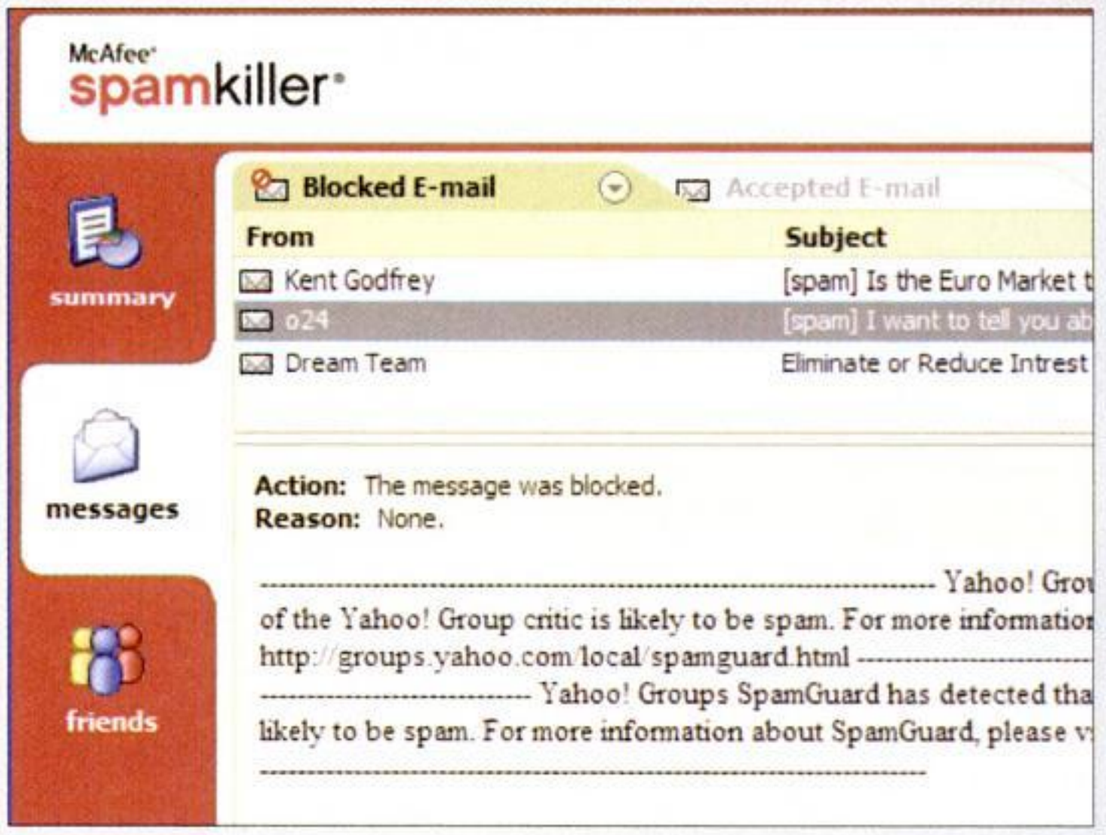
MCAFEE SPAMKILLER 2005

Symantec's *AntiSpam* is bad, but McAfee's *SpamKiller* is—incredibly—far worse. On the surface, nothing seems amiss; it installs the McAfee *Security Center,* updates its content filters automatically via McAfee's servers, and then lets you whitelist addresses in your address book.

Unfortunately, once installed, *SpamKiller* doesn't seem to do much good: The first message we received had a subject line reading "[spam] Fw:", which *SpamKiller* cheerfully allowed to land in our inbox. Things didn't get any better over time—this ferocious-sounding app bagged a mere 30 percent of spam messages.

On top of that, it's a pain to use. Integration with your e-mail application is poor (though *SpamKiller* does work with any POP3 client, and it also supports MSN/Hotmail). An anti-spam tool needs to integrate *tightly* with an e-mail application in order to ease the pain of spam as much as possible. *SpamKiller's* toolbar buttons are barely functional and sometimes don't work: You'll often click the "Junk" button to mark a message for deletion as spam and watch as… nothing happens. Ultimately, *SpamKiller* is more of a problem than a solution.

MAXIMUM PC VERDICT 2 $40, http://us.mcafee.com



Checking blocked messages for false positives means opening a separate e-mail program, a major hassle.

QURB 3.0

We're normally suspicious of anything that starts with the letter Q (except for Q-Bert), but *Qurb's* anti-spam application uses a stern whitelist system that's one of the most effective—although not hands-off—methods of controlling spam.

Qurb integrates exceptionally well with *Outlook* and *Outlook Express,* but alas, no other applications or webmail services. Upon installing, it immediately scans your mailboxes for "approved senders," and automatically ignores any old junk or deleted items folders. Then it uses this data to create a whitelist. There's no keyword filtering or other tricks: If you're on the list, your mail gets through.

If you get a lot of e-mail from people who don't normally write to you, this system can present a problem, and indeed we were inundated with false positives, which we constantly had to retrieve from quarantine. But *Qurb* also allows you to turn on a challenge/response system so that anyone not on your whitelist can generate a request to become part of your personal e-mail club. Whitelisting isn't an effortless approach, but if you're serious about exterminating spam, *Qurb's* a lethal weapon.

***Qurb's* "verified" stamp indicates that a message is genuine and not an unsolicited message.**

MAXIMUM PC VERDICT 7 $30, www.qurb.com

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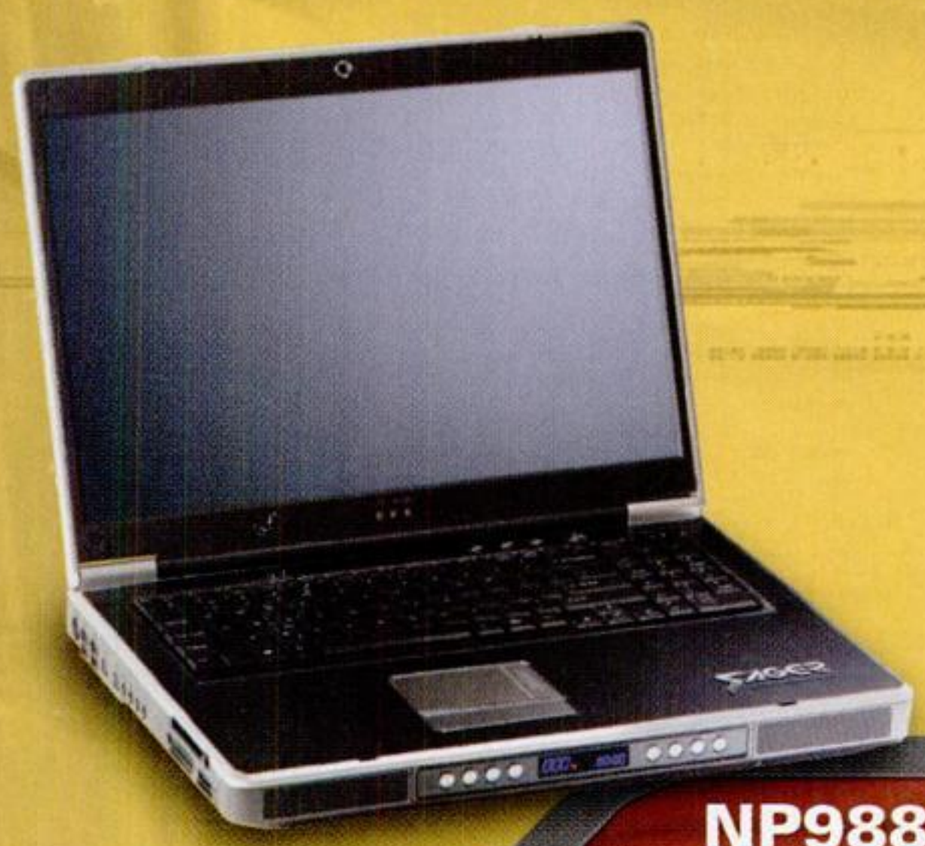

NP9880

NP3880

NP9880C $2795

FEATURES

> Dual Channel DDR2 System Memory supports 400/533MHz, provides the best match for Intel® Processors and enables power efficiencies for data intensive business, multimedia, and gaming applications.

> nVIDIA® GeForce™ Go 6800 Ultra PCI-Express™ Graphics Module[5] with 256MB DDR3 Memory delivers true-to-life graphics at blazing speeds.

> The front panel Audio DJ CD player control with separate power switch lets you play your favorite music CD or MP3 while on the go.

> Dual Optical Device bays and Dual Hard Disk Capability allow this system to be customized with 2 CD-ROM devices and 2 Hard Drives coexisting for maximum storage capacity.

OPTIONS

> 802.11g Wireless Module
> 802.11g and Bluetooth Combo Module
> TV Tuner with Remote

> 17.0" Wide Viewing Angles WUXGA Active Matrix Display with Super Clear Glare Type Screen
> Intel® Pentium®4 Processor 530 with HT Technology (1MB L2 Cache, 3.0GHz, 800MHz FSB)
> 256MB DDR3 nVIDIA® GeForce™ Go 6800 Ultra PCI-Express™ Graphics
> 512MB Dual Channel DDR2 SDRAM
> 40.0GB 5400RPM Ultra ATA100 Hard Drive
> 8X DVD²/24X10X24 CD-RW³ Combo Drive
> Full Size Keyboard with Numeric Keypad
> Front Panel Audio DJ with Separate Power Switch
> Hardware Raid 0,1 Function
> Built-In Digital Video Camera
> Built-In 7-in-1 Card Reader
> 4 Built-In Speakers with a Subwoofer
> External USB 1.44MB Floppy Disk Drive
> Integrated Fax Modem[4] and 10/100/1000 Ethernet
> Microsoft® Windows® XP Home Edition
> Sager's Umbrella Protection Policy

NP3880C $1495

FEATURES

> nVIDIA® GeForce™ Go 6600 PCI-Express™ Graphics with 128MB DDR Memory delivers best-in-class performance and brilliant video for gaming and multimedia business applications.

> Dual Channel DDR2 System Memory supports 400/533MHz, providing the best match for new Intel® Pentium® M Processor.

> Integrated 4-in-1 Card Reader supports SD/MMC/MS/MS Pro provides fastest and easiest way to transfer your digital media.

> Communication on-the-go with integrated 802.11a/b/g Wireless and 10/100/1000 LAN.

OPTIONS

> Bluetooth Module
> Port Replicator

> 15.4" WSXGA+ Active Matrix Display
> Intel® Centrino™ mobile technology
– Intel® Pentium® M Processor 740 (2MB L2 Cache, 1.73GHz, 533MHz FSB)
– Intel® PRO/Wireless 2915ABG LAN 802.11a/b/g
> 128MB DDR nVIDIA® GeForce™ Go 6600 PCI-Express™ Graphics
> 512MB Dual Channel DDR2 SDRAM
> 40.0GB 5400RPM Ultra ATA100 Hard Drive
> 8X DVD²/24X10X24 CD-RW³ Combo Drive
> Built-In Digital Video Camera
> On-Board 56K V.90 Modem[4] and 10/100/1000 Ethernet
> Built-In 4-in-1 Card Reader
> 4 Built-In Stereo Speakers
> Virtual 6 Channel External Speaker Output
> 3D Enhanced Sound (S/PDIF Output for DVD)
> Microsoft® Windows® XP Home Edition
> Weight: 7.9 lbs with Battery
> Sager's Umbrella Protection Policy

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sagernotebook.com

Or call us at:
800.669.1624

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SPYWARE/ADWARE

The modern flipside of the virus is spyware, which can be just as troubling and difficult to remove as an old-school virus. Stand-alone anti-spyware apps stop the menace with scheduled drive scans, immunization systems to prevent known spyware apps from sinking their claws into key files on your system, and real-time protection to guard against threats as they arrive. No matter which one you choose, we recommend pairing up a commercial product with the freeware *SpyBot Search & Destroy* (reviewed on page 39) for maximum protection.

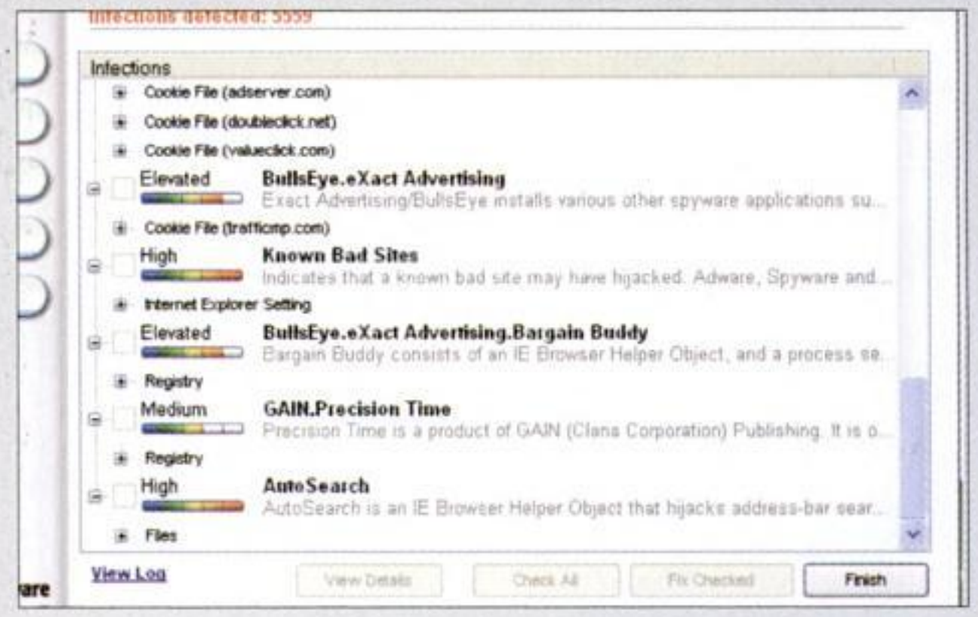
PCTOOLS SPYWARE DOCTOR 3.2

Imagine our horror when *Spyware Doctor* scanned our system to reveal a whopping 5,600 infections on our test PC! While this ultimately turned out to comprise a mere eight spyware apps, we were still impressed with the thoroughness of the *Spyware Doctor* scan, even though it was a little hysterical in its analysis.

Scanning took just 45 seconds to complete, and a detailed report outlined every threat, assigning each a Rumsfeld-friendly color-coded threat level. The OnGuard tool provides reasonably effective real-time protection in the background, and *Spyware Doctor* has an immunization system as well. The interface is a snap—even a smart gorilla or dolphin would have little trouble using it to quickly and expediently scrub the dreck out of a PC.

Our one major complaint is that *Spyware Doctor* doesn't automatically update itself with the latest anti-spam definition files—it's up to you to remember to run the update system manually.

MAXIMUM PC VERDICT 7 $30, www.pctools.com



Red means bad! Junk the worst offenders and decide whether lesser threats are worth deleting.

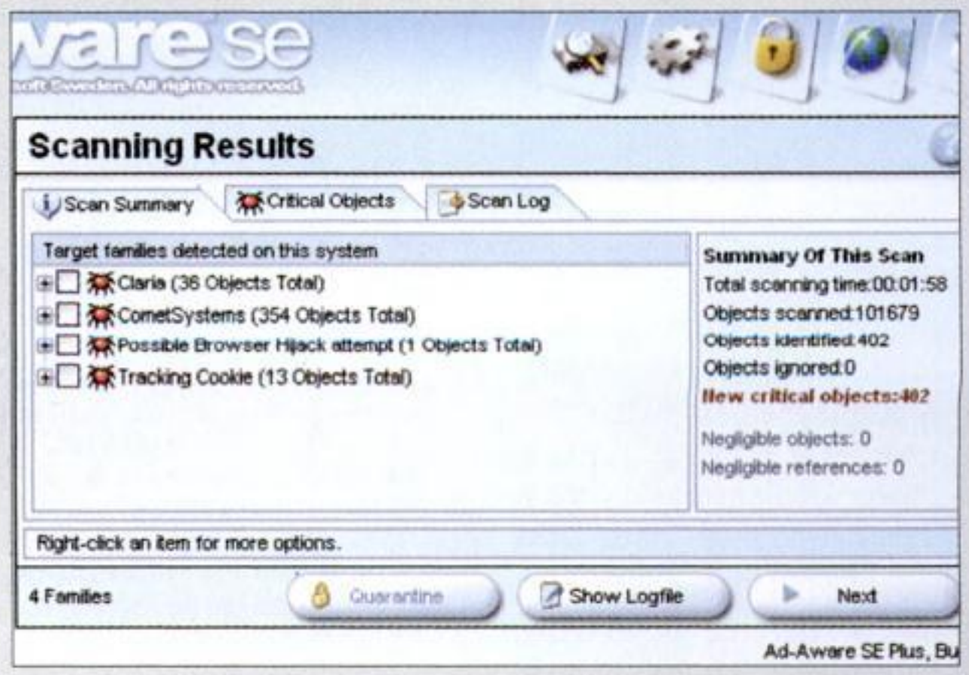
LAVASOFT AD-AWARE SE PLUS

Dating back to 1999, Lavasoft's *Ad-Aware* has achieved celebrity status. But has success gone to its head? It's certainly looking great, what with that splashy interface, but *Ad-Aware* seems to have forgotten how to actually locate and identify spyware. After a two-minute scan (the longest in our roundup), *Ad-Aware* was able to ID only two spyware infections, missing most of the biggies we had seeded on the system.

Ad-Aware SE Plus is the same app as the free version of *Ad-Aware,* with the addition of a real-time scanner called *Ad-Watch.* And it's in real-time that *Ad-Aware* really shows its stuff, offering one of the most effective blockers on the market. But this will be of no use if you already have spyware on your system, and we have doubts that *Ad-Aware's* real-time blocker would be able to stop an infection that it was unable to identify post installation.

Ad-Aware lacks an immunization system, but program updates are easy to locate and they arrive nearly instantaneously. It's not a bad choice for a second line of defense, but *Ad-Aware* seems to have forgotten its roots, and you don't want your PC to pay as a result.

MAXIMUM PC VERDICT 5 $27, www.lavasoftusa.com



Even a comparably lengthy scan turned up very little spyware on our infested test machine.

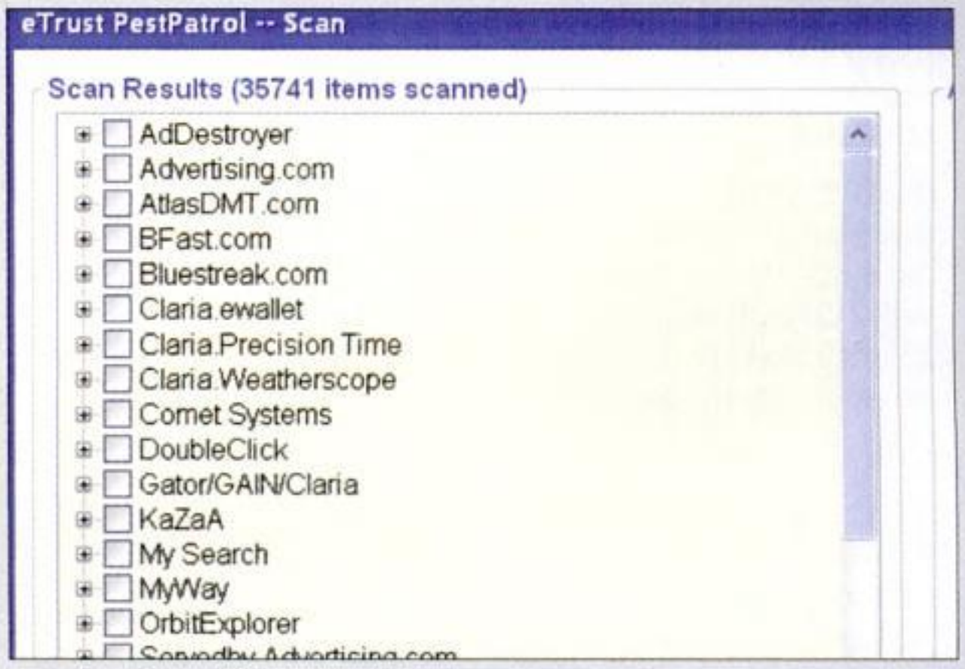
ETRUST PESTPATROL 2005

Let's get straight to the point: *PestPatrol* is the most effective anti-spyware system—short of a switch to Linux—that we've ever used.

PestPatrol looks like an application that was ported from OS/2, with unclear buttons and a paucity of configuration options; however, its primitive interface belies a powerful spyware-fighting tool. You probably won't need to delve into the advanced configuration anyway—just punch "Scan" and you'll get an immediate report of all the spyware on your system. And we mean *immediate*: *PestPatrol's* quick scan took all of 10 seconds, so fast that we assumed the app couldn't have done much.

We were wrong: *PestPatrol* listed 21 spyware apps on our machine, including a few we didn't even know we had! Now *that's* worth 30 bucks. *PestPatrol's* real-time blocker is less effective, and offers no immunization scheme, but if you care even one whit about your PC's hygiene, apply *PestPatrol* liberally and tell those spyware companies where they can stick their junk.

MAXIMUM PC VERDICT 8 $30, www.pestpatrol.com



We didn't even install some of this spyware on our test machine—but *PestPatrol* found it anyway.

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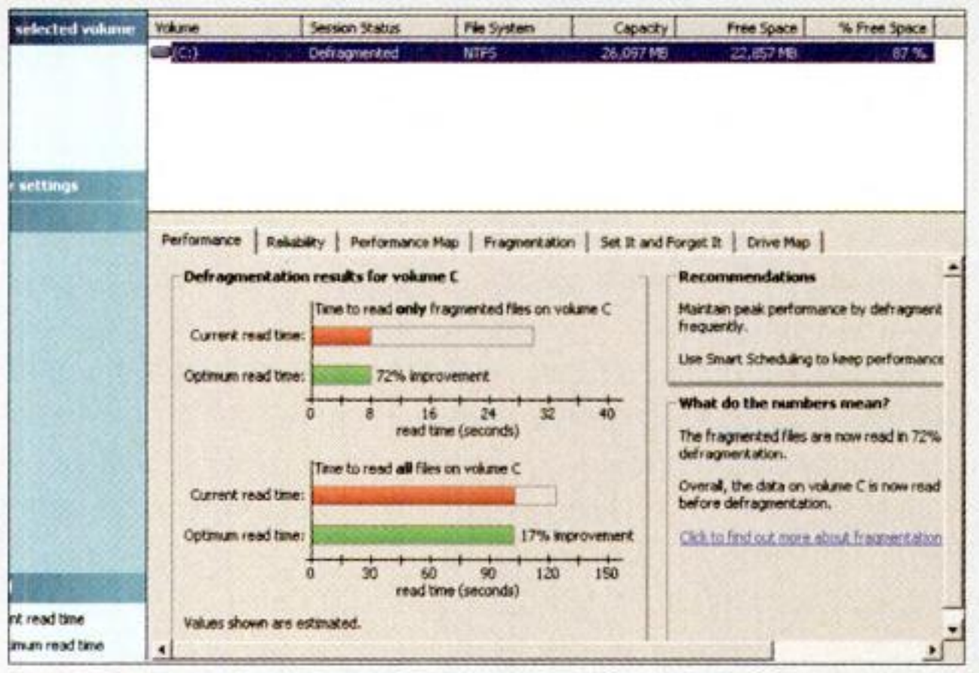
OS PLAQUE/DRIVE FRAGMENTATION

Good PC hygiene means a defragmented hard drive, a squeaky-clean Windows Registry, and the nooks and crannies of your system purged of the remnants of applications long gone—and a good utility should be able to schedule all of these fixes to happen automatically. Some apps, such as *Diskeeper*, specialize in only one piece of this puzzle, so be sure to shop around to get all the clean-up components you need.

EXECUTIVE SOFTWARE DISKEEPER 9 PROFESSIONAL

Drive fragmentation is the equivalent of household dust—a subtle, creeping menace that only gets worse with time. Defragmentation utilities such as *Diskeeper* take bits that have been scattered over your hard drive nonsequentially and rewrite them in nice, contiguous sectors so your drive doesn't have to go on a scavenger hunt to retrieve them. If you want to wring out every last drop of your drive's performance, don't bother with the $20 Home version—*Diskeeper Professional* is much faster, defragging a heavily fragmented 25GB partition in just over 10 minutes. *Diskeeper Pro* also has myriad scheduling options—most users will never have to manually launch the program after its initial configuration. If you're really anal, *Diskeeper* can even defrag your system in real time, all the time. When you need to get to work, *Diskeeper* politely stands down any background tasks to relinquish power to your foreground apps.

MAXIMUM PC VERDICT 8 $50, www.execsoft.com



After defragging with *Diskeeper*, you should see a substantial improvement in file access speeds.

WEBROOT WINDOW WASHER 6.0

Window Washer is a bit like a Roomba for your PC, sweeping up temp files and trace data that you no longer need. But the idea that a few (or even a few thousand) temp files can have a radical effect on system performance is a dubious one: If the files aren't being used, they simply aren't going to get in the way of the ones that are being used. Sure, temp files can add a bit of disk fragmentation, but if you're using a defrag tool, even a PC that's heavily clogged with temp files should be able to chug along without a hitch.

On the other hand, temp files can contain passwords and potentially embarrassing data like your abandoned love letters to Christina Aguilera, exactly the type of thing you don't want posthumously circulated among your friends.

Don't expect a flood of free disk space to come back to you after a sweep—on our junk-infested test system we reclaimed a wispy 30MB of hard drive space. This type of utility is only useful to the kind of borderline obsessive whose underwear and socks just have to match.

MAXIMUM PC VERDICT 6 $30, www.webroot.com

***Window Washer* automatically discovers your installed apps; its internal database knows where to find the temp files so you don't have to go searching.**

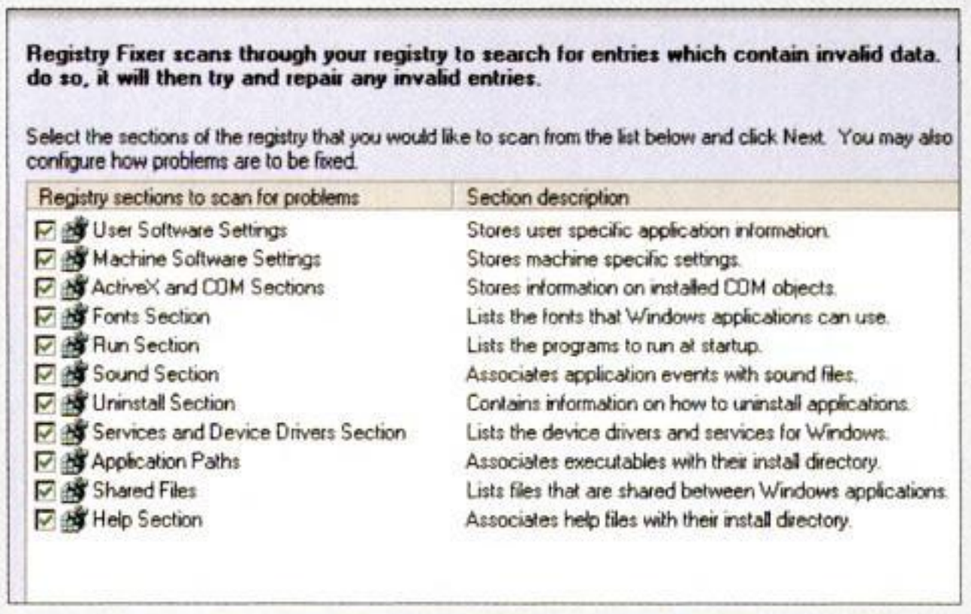
VCOM FIX-IT UTILITIES 5 PROFESSIONAL

VCom's utility suite boasts more than a dozen system cleanup tools for a relatively modest price. But even a modest price is too much for software that doesn't deliver on its promise.

While the bare essentials are here, getting them to work well is difficult. Even though some descriptive text is included, it's hard to understand the difference between *DiskFixer, MediaVerifier,* and *SystemSaver,* all different modules with very specific goals. And after running several scans, *DiskFixer* automatically deleted a pile of files we didn't want tossed. These were easily rescued from the Recycle Bin, but it would have been charming if *Fix-It* had asked us first. And we had no idea what to make of a Registry clean-up tool that gave us no options or final report aside from "273 items were deleted."

Other features included in *Fix-It 5 Pro* are an antivirus application and replacements or enhancements for Windows Explorer and Windows System Restore. Woo.

MAXIMUM PC VERDICT 4 $50, www.v-com.com



***Fix-It Utilities* lets you choose which parts of the Registry you want to fix, in case you're feeling picky about it.**

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THE SUITES

Utility suites can be a great value, but if you don't really need every component, then you might as well use your cash to light a fire. Consider each piece of software included in a suite: Is it something you'll really need, or is there a better solution available a la carte? Keep in mind that suites may also be the *only* way to get certain applications: *Norton Speed Disk,* for example, is only available as part of *Norton SystemWorks.*

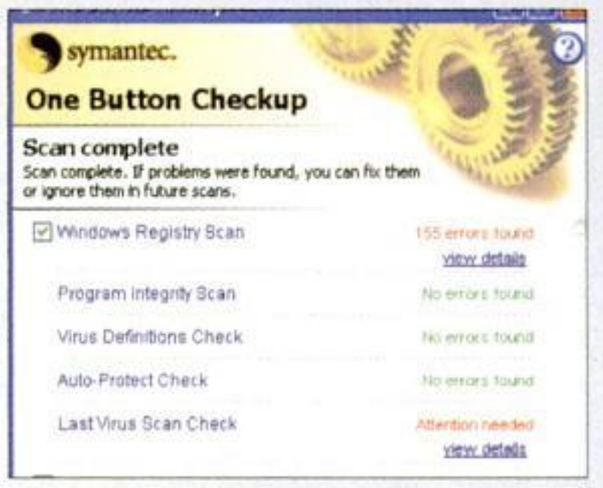
SYMANTEC NORTON SYSTEMWORKS 2005 PREMIER

Norton SystemWorks is crammed full of so many gizmos that you may not know where to start, but a little patience in delving through *SystemWorks'* menus will pay off: Under the hood you'll find a half-dozen options for spanking your PC back into prime operating condition, even if some key elements (like an anti-spyware app) are missing.

Norton AntiVirus and *Norton Utilities* are the core of *SystemWorks 2005.* The antivirus application is the exact same as you'll get in its standalone variety (see our review on page 31). *Norton Utilities* offers a wide range of sub-utilities, including *Speed Disk, System Doctor, Disk Doctor,* and *WinDoctor.* But you've also got the option to skip the manual and go with the One Button Checkup, which runs a set of scans and checkup routines to clean up the Registry, update virus definitions, delete dead shortcuts, and run a full virus check, among other actions. The scan takes some time—plan on having it run for a half hour or longer—but the amount of detritus it finds on your PC might knock you off your bar stool. If you're concerned about temp files, cookies, and the like, check out the *Norton Cleanup* subsystem, which will scrub every cache it can find.

Punch the One Button Checkup to start a comprehensive system scan rolling.

***SystemWorks* uncovered hundreds of problems on our test machine and even got a buggy *Outlook* installation working again.**



SystemWorks Premier also includes some additional features that are less useful. *Norton GoBack* doesn't have much purpose today in the era of Windows System Restore, and *Connection Keep Alive* (designed to "keep your dialup Internet connection from disconnection unexpectedly") comes across as almost quaint.

There's a $70 version of *Norton SystemWorks* that doesn't include *Norton Ghost,* but we think everyone should have a drive imaging utility.

MAXIMUM PC VERDICT 7 $100, www.symantec.com

IOLO SYSTEM MECHANIC 5 PROFESSIONAL

There's nothing that *System Mechanic Professional* thinks it can't do—it's one of the most exhaustive and even excessive applications we've ever airlifted into the Lab.

Printing a list of *System Mechanic's* features would consume half of this magazine, so we'll be brief and hit the highlights. Among some 20 mini-apps within the mega-program you'll find: antivirus software, a firewall, a disk defragmenter, a temp file destroyer, a pop-up blocker, an anti-spyware app, and a secure file deletion tool. Lesser apps include a Registry cleaner, a privacy filter, and a duplicate file hunter.

The core apps—the antivirus and firewall tool—come courtesy of Kapersky Lab. Together Kapersky's *Anti-Virus* and *Anti-Hacker* would cost you about as much as the entire Iolo suite. Kapersky isn't a household name because both of its tools are slower than molasses. Unfortunately, the rest of the Iolo suite isn't exactly speedy, either. Downloading updates takes an eternity, but that's quick compared with virus scans that take several hours to complete. The Kapersky *Anti-Hacker* tool (read: firewall) was particularly aggravating. Its unintuitive pop-up interface doesn't respond well to commands to open ports, and it lacks the option to allow permanent access to third-party applications. What a hassle.

Finally, at least two of Iolo's sub-applications seem questionable, and possibly dangerous. We're still not sure why we'd need or want to "compact the registry" or "defragment memory" (RAM, not the hard drive); neither selection seemed to do anything on our test machine, but we can't imagine that either is a remotely good idea.

***System Mechanic's* choices can be overwhelming, but its iconic interface makes choosing an application relatively easy.**

Iolo's suite offers too many frivolous apps and too little power and common sense, so we recommend going a la carte unless you're on a serious budget.

MAXIMUM PC VERDICT 6 $70, www.iolo.com

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FREEWARE

There's no reason to get angry about paying for software that performs tasks Windows ought to do straight out of the box—there's plenty of capable and frequently updated software available on the web for the exceptional price of "free." But keep in mind that freeware, or freeware versions of commercial software, might lack fancy features, offer limited or no technical support, and might not be updated as aggressively as commercial products.

ANTIVIRUS

AVAST! 4.6 HOME EDITION

Aside from a kickin', pirate-like product name, *avast!* is probably the best freebie virus scanner you can download. It's slow and the interface is far from intuitive, but it's frequently updated, and you get some high-end features such as real-time and background scanning. As an alternative, most major antivirus vendors offer free web-based virus scanners: Just visit **housecall.trendmicro.com** or **us.mcafee.com/root/mfs/default.asp?cid=9913** for a quick scan with nothing to download.

MAXIMUM PC VERDICT 6

Free, www.avast.com

FIREWALL

KERIO PERSONAL FIREWALL 4.1.3

Of the handful of free firewalls on the market, *Kerio Personal Firewall* is gaining traction as our favorite. It's a more complex piece of software than the commercial firewalls in our roundup, but it's remarkably sturdy. Opening ports for custom applications is trickier than it should be, and newcomers will be stumped if they attempt to tweak some of *Personal Firewall's* features, but it's better than the other free alternatives. *ZoneAlarm* also comes in a stripped-down free version, but it doesn't allow you to open ports manually.

MAXIMUM PC VERDICT 6

Free, www.kerio.com

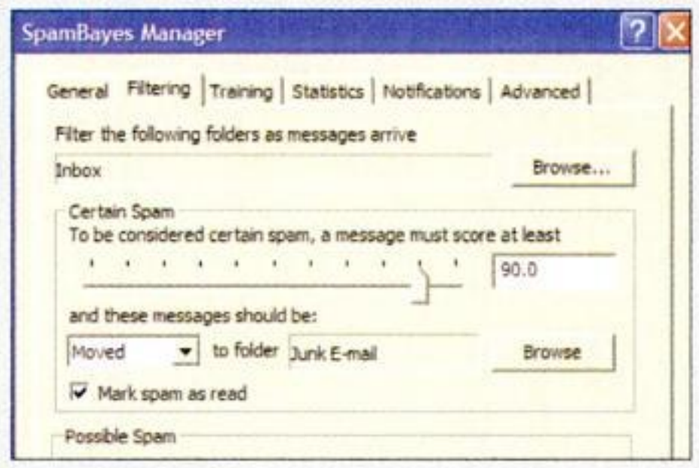
ANTI-SPAM

SPAMBAYES 1.0.4

The free, open-source project *SpamBayes* is a strict content-filtering spam killer that works completely based on your training: Mark a message as spam, and similar messages are more likely to end up in your junk folder. You can train *SpamBayes* to recognize anything as spam, from genuine junk to letters from your boss. It hooks into *Outlook* without a hitch, and offers some dashing configuration options—want definite spam to be marked as read but suspected spam to be left unread? No problem with *SpamBayes*.

MAXIMUM PC VERDICT 8

Free, www.spambayes.sourceforge.net



ANTI-SPYWARE

SPYBOT SEARCH & DESTROY 1.3

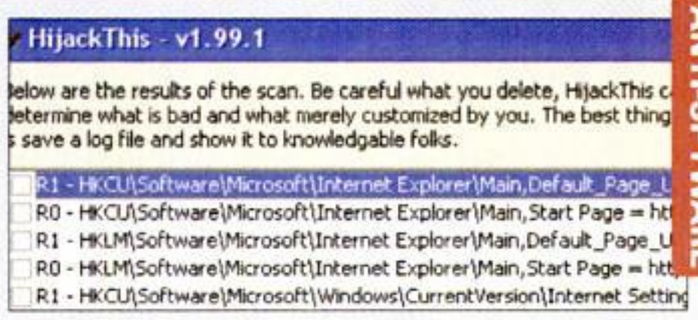
Who'd have guessed that the best anti-spyware app in existence is a freeware program designed by one dude from Germany? *SpyBot* is lean, mean, and ruthless when it comes to ferreting out spyware. The interface may be homely, but after running the program two or three times, you'll be scanning and slamming that spyware away. *SpyBot* isn't 100 percent effective—no anti-spyware software is—so it's best used alongside another anti-spyware app that can pick up any junk *SpyBot* misses. For the price, we don't expect perfection, but *SpyBot* comes awfully close to providing it anyway.

MAXIMUM PC VERDICT 9

MAXIMUM PC KICK ASS PRODUCT

Free, www.safer-networking.org

ANTI-SPYWARE



HIJACKTHIS! 1.99.1

Detecting spyware is only part of the job, and often even the most perceptive anti-spyware applications are all thumbs when it comes to removing nasties from your system. For those really tenacious bits, you need *HijackThis*! It's not for the faint of heart—its results are just a log file with a scary-looking list of all the currently running applications. These log files can be hard to understand, so turn to an online FAQ (see **http://hometown.aol.co.uk/jrmc137/hjttutorial/tutorial.htm**) or post your log file at **http://forums.spywareinfo.com** if you need help separating spyware from apps that are supposed to be there. *HijackThis!* is often your last, best hope at fixing an infestation before you give up and reinstall Windows.

MAXIMUM PC VERDICT 7

Free, www.spywareinfo.com/~merijn/

REGISTRY CLEANER

GLARYSOFT REGISTRY REPAIR 1.42

There are many serious Registry repair tools on the market, and almost all trial-ware versions are invariably limited, letting you fix only a few dozen problems at most. Because we often see Registries fouled with hundreds of bogus entries, that kind of crippleware is useless. GlarySoft's *Registry Repair* is the only app we know of that will pick the nits out of your Registry for a full 30 days. And it does a pretty good job, too—though we had to scan our system twice to catch all the problems.

MAXIMUM PC VERDICT 8

Free 30-day trial, then $20, www.glarysoft.com

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SIMPLE STEPS TO GOOD PC HYGIENE

Maximum PC walks you through the most common tasks necessary to keep your PC fresh, healthy, and free of communicable disease.

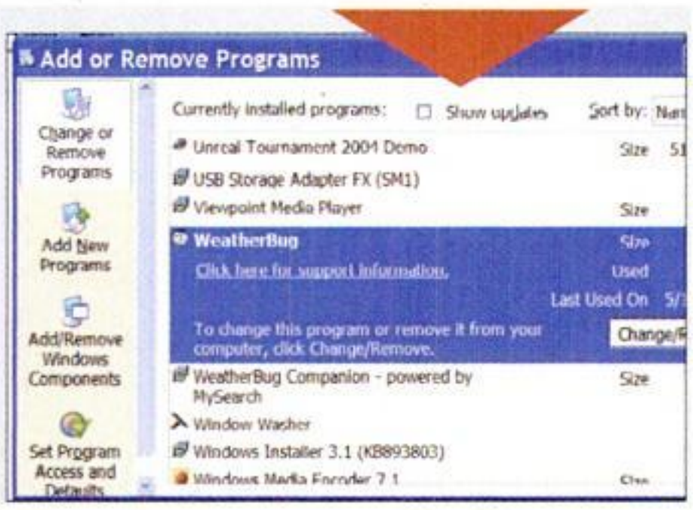
EVICT SPYWARE FROM YOUR SYSTEM

Uh oh—you just clicked that executable and it sprayed spyware all over the place. Here's what to do.

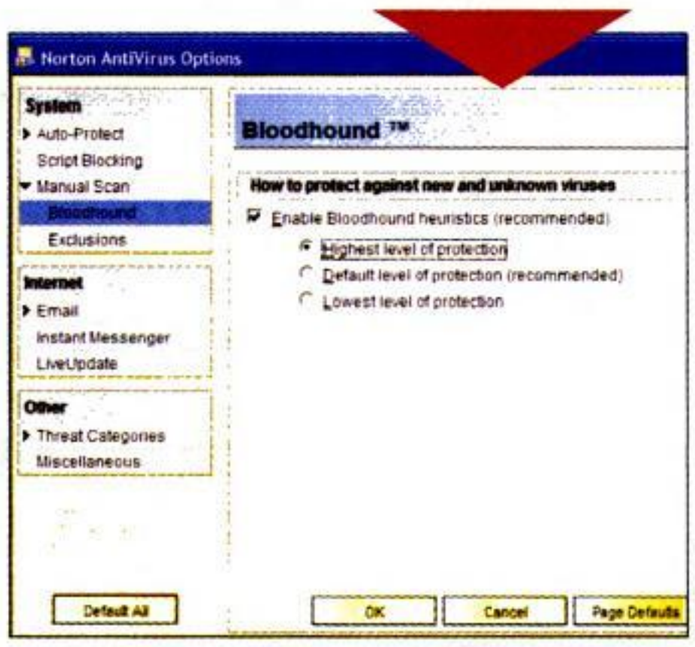
1 Admit your mistake. Pledge never again to click "YES" when an *IE* pop-up window says, "Your system might be compromised!!! Repair now?"

2 Check the Add or Remove Programs control panel for anything suspicious. Only the friendliest spyware/adware programs will show up in the control panel, but it's the most reliable way to remove anything that does, as anti-spyware tools tend to leave some scraps behind. Remove anything that's suspicious. If you have trouble with the removal, try the same procedure in Safe Mode. (Running in Safe Mode is good advice for any of the below steps. Because Safe Mode runs only absolutely necessary apps, you may have more control over a badly infected system.)

3 Run a complete antivirus scan. Make sure your advanced scanning options are set to the highest level of protection. Scan inside compressed files and turn any heuristic scanning options to maximum protection.



Don't mess with an anti-spyware tool when you can use Add/Remove Programs to get rid of an unwanted application. Be sure to get all the pieces—*Weatherbug* has two installed apps.



If you are particularly virus-prone, up the ante by increasing the security sensitivity.

4 Run *Spybot Search & Destroy* (see page 39) after updating the program definition files. It may require several reboots to flush out all the spyware on a badly infected machine.

5 Run a second anti-spyware scanner, such as *PestPatrol*. This will help eliminate any hidden apps that Spybot didn't catch.

6 If you're still infested, run *HijackThis!* to generate a log of active system processes. If you can't interpret the log with the help of online searches, post your log file at **http://forums.spywareinfo.com** with a polite request for help. Someone will usually respond within an hour, advising you on which entries in the *HijackThis!* log you should disable, or what custom removal program might help your case.

7 If you're *still* infected, fire up Windows System Restore, and roll your system back to a distant checkpoint from a time before your PC was infected.

8 If spyware keeps popping up like prairie dogs, you're probably hosed. Your best bet at this point is to accept failure, back up your data, and wipe the drive, reinstalling Windows from scratch. Tell yourself you probably needed to do it anyway. It'll make you feel better.

RESPOND TO A VIRUS OUTBREAK

Something fishy is going on: You notice a ton of outbound traffic on your system, even though you're not doing anything. You're *infected*, dude. Here's how to nip a virus outbreak in the bud.

1 Make sure your virus definitions are up to date, then physically unplug your network connection. This will prevent rebroadcasting of the virus to the Internet or other machines on your home network.

2 Run your antivirus scanner in its most thorough scanning mode. Delete, repair, or quarantine any files.

3 Reboot in safe mode and run the scanner again in its most thorough mode.

4 If the infection persists, or you can't boot your computer at all, use the emergency disk that we know you created when your antivirus program offered you the option of doing so. With Symantec *Norton Antivirus,* you can boot from the installation CD to run an emergency scan. Alternately, you can use a third-party utility like *BartPE* (**www.nu2.nu/pebuilder/**) to access and scan an unbootable Windows install.

SEARCH MORE EFFECTIVELY

Eliminating spyware and viruses often means manually hunting down a specific file. Here are a few tips to help root out the perp.

1 In Windows Explorer, click Tools > Folder Options > View, and check the button for "Show hidden files and folders." Uncheck "Hide extensions for known file types" and "Hide protected operating system files." This makes all files, including system files, available to your search.

2 Install *MSN Desktop Search* (**http://toolbar.msn.com**). We've found it to be far more effective at indexing system files than the Google or Yahoo desktop products, and you can download plugins (**http://addins.msn.com**) to search within ZIP and CAB files.

3 If *MSN Desktop Search* can't find your file, you'll have to do it the old-fashioned way, by searching within Windows Explorer. If you do a lot of searching and want more sophisticated features such as scheduled indexing or Boolean searches, trade up to a commercial search application like the ultra-brawny *dtSearch* ($200, **www.dtsearch.com**). We recommend avoiding WinXP's own indexing service—it's a rapacious performance hog. ■

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Alienware recommends Microsoft® Windows® XP Professional.

Domination!

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Area-51m™ 7700

Area-51® 3500

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Microsoft Windows xp Professional

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PICTURE THIS

We test the tar out of **11 high-performance desktop LCDs** to find out which are the best for power users

BY KATHERINE STEVENSON

Finding room for nearly a dozen full-size desktop LCDs in the Maximum PC Lab was not an easy task. Test benches were cleared, power outlets emptied, and key personnel were put on crash diets. Extreme times call for extreme measures. We knew we'd need the space to get an accurate grasp on the current state of today's high-performance LCD market—we had to evaluate displays en masse. After all, the only way to *really* test displays is with side-by-side-by-side-by-side comparisons.

We asked vendors to send us their best all-purpose desktop LCDs—displays that could handle anything from web browsing and word processing to image editing and gaming with aplomb. Screens that didn't measure at least 19 inches and connect via DVI were denied entry.

The Buyer's Guide on the next page explains the significance of the specs you'll face when making a purchasing decision. Following that, we review each display individually, and then tell you how they all stack up.

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photography by Mark Madeo, art direction by Boni Uzilevsky

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BUYER'S GUIDE

Know which specs matter and which are bunk, before you plunk down the cash for your next monitor

SCREEN SIZE: This is the size of the LCD panel measured diagonally from corner to corner. Desktop screens range in size from 15 to 23 inches and beyond; we consider 19-inches the minimum for all-purpose computing. You need at least that much screen real estate to work in multiple windows comfortably, and to thoroughly enjoy high-definition video and games.

ASPECT RATIO: A display's aspect ratio is its screen width divided by its height. The majority of desktop monitors have an aspect ratio of 4:3, regardless of their screen size; and the majority of software applications and computer games are designed accordingly. This is something to bear in mind if you're considering a widescreen model, which typically has an aspect ratio of 16:9. If content, such as a game, insists on a 4:3 ratio, the display will stretch the content to fill the entire screen, making everything look fatter than it should. This is becoming less of a problem every day, as most games support at least one widescreen mode that won't look distorted.

NATIVE RESOLUTION: Every LCD sports a fixed number of pixels arrayed in a grid that is a certain number of pixels high and a certain number of pixels wide. The native resolution is the width of the display (in pixels) by the height (in pixels). The native resolution will deliver an optimum picture. While it's possible to run an LCD at a lower, non-native resolution, the image will be rescaled and the display will use interpolation to fill in the missing pixels, which can degrade image quality. Native resolution and interpolation quality is of particular concern to gamers, who often run games at low resolutions to get the best frame rate.

An LCD's native resolution is typically determined by its screen size. For example, all the 19-inch monitors in this roundup have a native resolution of 1280x1024, while the 20-inch models have a native resolution of 1600x1200. A higher resolution makes everything look smaller on-screen, but also gives you more space on your desktop.

INTERFACE: Today's LCDs connect to the graphics board via either an analog VGA connector or a digital DVI connector. If your graphics board is equipped with DVI outputs—most modern boards are—we recommend you use DVI to connect to your LCD.

Unlike CRTs, which must refresh every pixel on the screen 60-plus times a second, LCDs modify pixels only when they change. The analog connection is less precise because the digital information must be converted to an analog stream in order to travel to the LCD, where it is then analyzed and converted back to a digital format. This is a recipe for data loss or corruption in the image that is ultimately displayed on screen.

CONTROLS: The degree to which you can adjust an LCD's picture via the onscreen display (OSD) varies among monitors; in some cases, you have fewer options with the digital interface because the manufacturer cheaped out. Adding hardware to the display that allows the user to manipulate the image detracts from the manufacturer's bottom line. We think it's important to have at least some control over color, brightness, and contrast.

PIXEL RESPONSE TIME: This spec has been getting a lot of play lately, so it deserves mention. A pixel's response time, measured in milliseconds, describes the time it takes for a pixel to change from its on state to its off state and then back on again. If the response time is too slow, you'll see ghosting and other artifacts because the display's pixels can't keep pace with the information sent from the graphics card. This problem is particularly noticeable in games, which tend to have fast action sequences.

A response time of 25ms was once the norm, but it's not uncommon these days to see response times listed in the single digits. As impressive as this spec sounds, it should be taken with a grain of salt. Different manufacturers report response times differently, so this spec isn't a reliable means of comparing different brands. Some vendors report only the pixels' rising (turning on) or falling (turning off) time; others report how long it takes for the pixel to turn on, turn off, and then turn on again; and still others report the time it takes for a pixel to go from peak white to full black. (Pixels change from white to black much faster than they change from gray to gray, but the latter is a much more common occurrence in real-world use).

Because of this inconsistency, we don't normally report on a display's pixel response time, but we've included it in our comparison chart at the end of this story to illustrate a point: Response-time specs often do not jibe with qualitatively measured performance. The best way to determine an LCD's abilities with fast-paced content, in our opinion, is to eyeball it first hand.

ERGONOMICS: Obviously, the more ability you have to adjust your screen's height, tilt, and orientation to fit your body, the better.

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HOW WE TESTED

All LCDs were tested with a GeForce 6600 videocard set to 32-bit color. We used an Extron DVI distribution amplifier (**www.extron.com**) to test up to four LCDs simultaneously for side-by-side comparisons. An NEC/Mitsubishi FE2111SB CRT served as a point of reference when evaluating the LCDs' black level, gray-scale accuracy, and ability with fast-motion content. All LCDs were set at their 6500K color temperature.

Our verdicts take into account the overall user experience, including each display's performance in the following applications:

DISPLAYMATE We use this diagnostic utility in all our monitor reviews. Its script of test screens is intended to isolate an LCD's abilities in key areas, revealing any flaws. (**www.displaymate.com**).

NEED FOR SPEED UNDERGROUND 3 The latest installment of the *NFS* series lets us jump into the car of our choosing and race around city streets at night, where we look for signs of ghosting and smearing in the passing landmarks and neon lights. We test all LCDs at their native resolution and at 1024x768.

INFOCOMM PROJECTION SHOOT OUT Designed for projection professionals, this collection of detailed digital images—both photographic and computer generated—is an excellent way to evaluate and compare an LCD's abilities with a wide variety of image-reproduction scenarios. (**www.infocomm.org**).

TERMINATOR 3 DVD Scene 8 (Pedal to the Metal) of the DVD offers a useful combination of dark environments (good for judging an LCD's handling of contrast) and lots of action (to test for response-time artifacts).

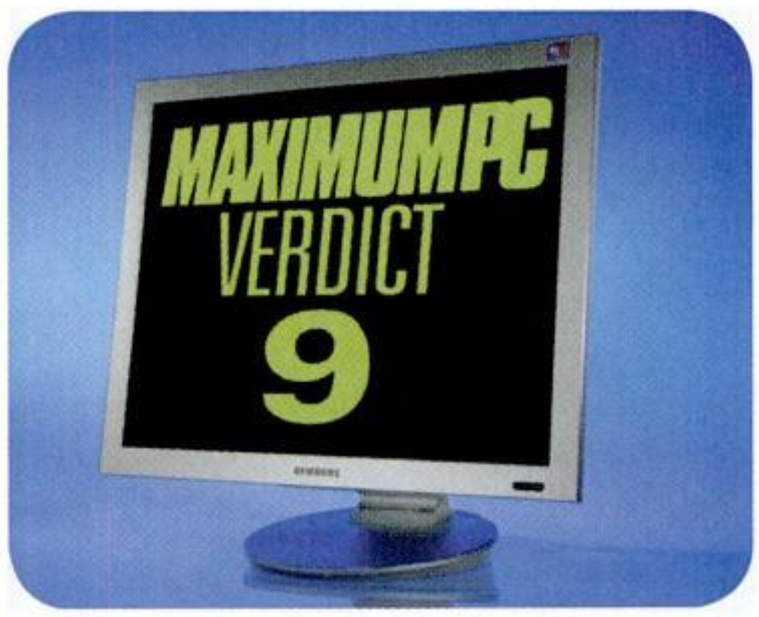
WMV HD We look at a series of Window Media High Definition Video (WMV HD) clips, which can be as much as six times the resolution of standard-definition DVD, to see how the LCDs process unusually dense video information.

Samsung 193P

The 193P's 19-inch screen sits atop an interesting dual-hinged neck that can be compressed or straightened for height adjustment, but only by a couple of inches. The flexible neck works to your advantage if you choose to hang the LCD on a wall using the VESA mounts in its base, but it's not practical for desktop use—the display can't even swivel from side to side.

The 193P's cabinet doesn't house any controls except the power button—Samsung's idea of a "hands free" design. This is actually a misnomer, as the controls were just moved to a Windows program. It's a unique twist, and the implementation is easier to use than some of the muddled onscreen controls we've encountered, but it's gimmicky and doesn't improve your options for adjustability.

The 193P sported one of the brightest screens of the bunch, and it maintained good contrast and respectable black levels (though on a completely dark screen, some internal light could be seen around the display's edges). Gray-scale reproduction was smooth and accurate up to the 128- and 256-step scales, at which point banding in spots and expansion of dark grays at the lowest intensity levels became evident. Still, we were hard-pressed to find image-quality flaws in either our DVD samples or the Shoot Out test images. The screen also proved able with gaming, at both its native and non-native resolutions.



$650, www.samsung.com

LG L1980Q

LG touts the L1980Q as "the slimmest flat screen of its class," but it's actually no slimmer than Samsung's 193P. In fact, the two possess nearly identical chassis.

Unlike Samsung's 193P, however, the L1980Q comes equipped with onscreen controls, if you can call the twitchy hyper-touch-sensitive nubbins and unintuitive menus "controls." When it comes to black levels, the L1980Q stood out among the competition like a sore, gray thumb. Turning the brightness all the way down helped some, but the display still failed to produce a deep black and the diminished contrast between "black" and dark gray was unacceptable. The solid dark screen also revealed lighter and darker patches at various parts of the screen.

In our gray-scale reproduction test, the L1980Q showed signs of compression or expansion of shades at various intensity levels when tasked with 128 or more distinct shades. The hue of the levels at the dark end of the scale was also inconsistent, indicating an incongruity in the black levels of the red, green, and blue color channels.

Despite these flaws, the L1980Q's reproduction of the Shoot Out test screens was acceptable, though in instances when depth of field was determined by subtle changes in shade, the images appeared comparatively flat. And although the screen was set to its 6500K color temp, images were awash in a slight purplish cast, which was particularly noticeable in flesh tones. The screen was free of visual artifacts in our gaming challenge.

$795, www.lgusa.com

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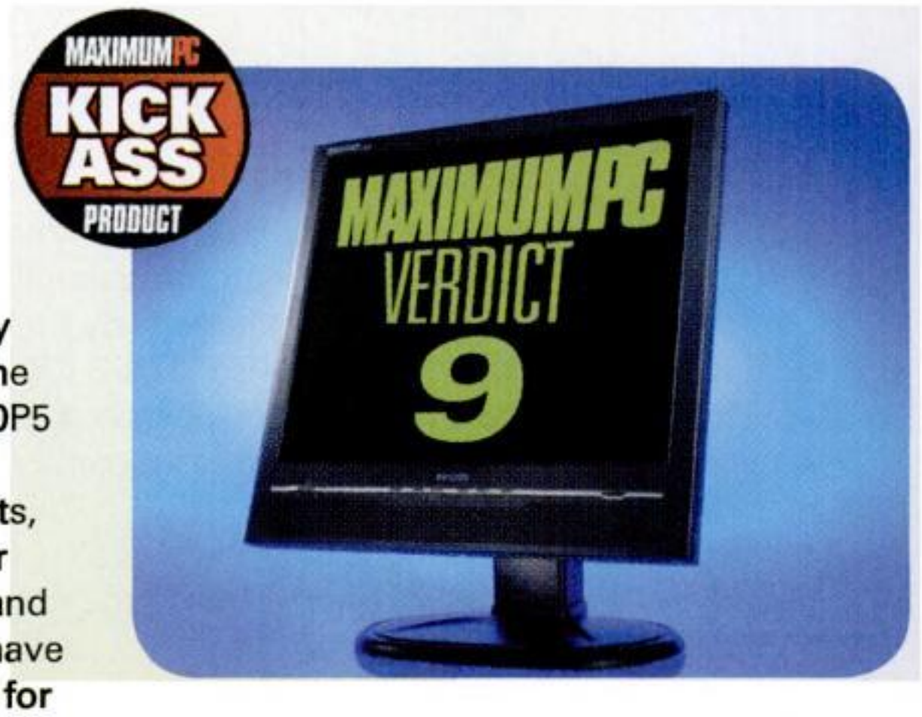
Philips 190P5

The 190P5 pooh-poohs trendy design flourishes with a bold, black cabinet that's both sturdy and stately. The neck can be raised by as much as five inches, and the display can pivot, rotate, and tilt to meet a wide range of viewing preferences. Its straightforward OSD offers sufficient picture-adjustment options in DVI mode.

The 19-inch screen is capable of a dark, dense black level, although when totally black, you can see the display's internal light in one isolated spot on the screen's right edge. We're able to forgive that small flaw, however, given the 190P5's superb performance. Its gray-scale reproduction was smooth and completely free of artifacts, virtually indistinguishable from our reference CRT. The CRT-like performance continued through all our tests. In our Shoot Out test images, flesh tones looked life-like, shadows and reflections looked realistic, colors were vibrant, and every fine detail was perfectly reproduced. The only obvious disparity between the 190P5 and the reference CRT was in off-axis viewing. Due to light-polarization effects, LCDs typically suffer contrast and color reversal when viewed from an angle, and the 190P5 is no exception. Still, you'd have to be standing pretty far off to the side for the negative effects to be troublesome, so we don't consider this a serious issue for this desktop monitor.

DVD action sequences played without a hitch, HD content was free of artifacts, and fast-pace gaming was perfectly acceptable at the 190P5's native and non-native resolutions. Bravo, Philips.



$580, www.philips.com

Norcent LM-960

Norcent's LM-960 19-inch is the least-expensive LCD in this roundup, and the reason why is obvious: This is a no-frills display. It's the only monitor in this roundup that didn't come with a DVI cable. And the plain black cabinet certainly won't turn any heads—in fact it won't turn, period. The display stand is completely fixed, although the display will fold back onto its base for compact storage or easy transport.

The LM-960's performance didn't reflect its low price, however. The screen is capable of a deep, totally uniform black level, even when viewed off-axis. It was one of the few screens we tested that was completely free of any sign of internal light. Gray-scale reproduction was accurate all the way up to a 256-step scale, where we saw some irregularities—the screen was incapable of resolving subtle distinctions between shades.

At its 6500K color temperature setting, the screen had a slight yellowish cast compared to our reference display, skin tones appeared jaundiced, washing out some fine detail from our test images. Adjusting the onscreen color sliders helped, but we weren't able to completely fix the problem. The LM-960 held up in our gaming evaluation at its native resolution of 1280x1024 as well as at 1024x768. This is noteworthy because the LM-960 lists one of the slowest response times in this roundup—25ms—yet it handled fast-motion content as well as LG's 8ms L1980Q.

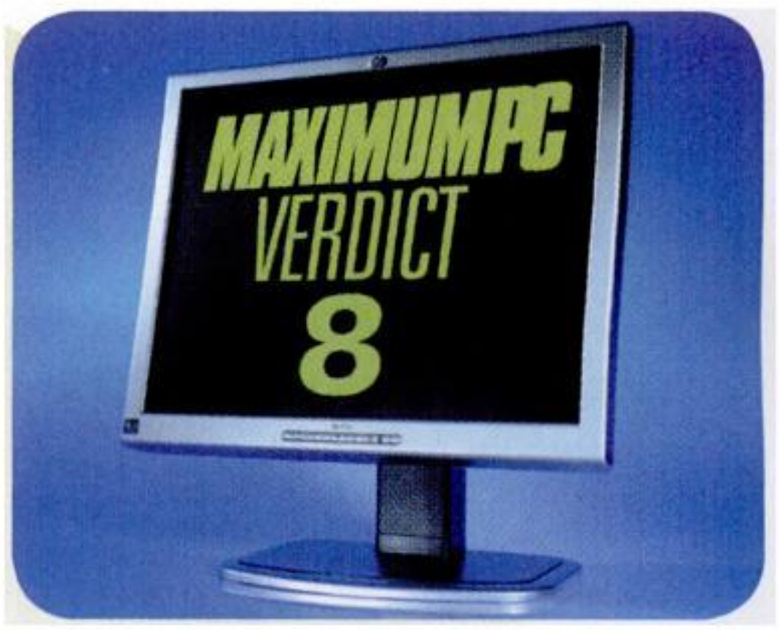
$450, www.norcent.net

Hewlett-Packard L2035

The L2305 sports a massive 20-inch panel and 1600x1200 native resolution, which obviously affords you more screen real estate. The cabinet is a simple, slim-bezel affair with black and silver styling, and it features an telescoping neck, as well as tilt, rotate, and pivot functionality. Its OSD buttons are right up front and easy to use. So far, so good.

In the *DisplayMate* tests, however, we found the L2035's black level lacking. Turning the brightness all the way down helped; but, we lost contrast at the dark end of the gray-scale and whites looked muddy as a result. We settled for an intermediate setting, but the result was unsatisfactory. We also noticed a very slight color-registration error, with hues in the gray-scale shifting at various intensity steps. There was also some loss of distinction between steps at the extreme dark and light ends of the gray-scale. Be that as it may, our Shoot Out test images appeared strikingly attractive when displayed on the L2035's vast screen. The colors were almost a perfect match with our reference CRT, though not as dead-on as Philips' 190P5. And in images that contained deep shadows, some detail was lost.

In the *T3* DVD action sequence, the only noticeable flaw was, again, some loss of contrast in dark scenes; the screen handled our HD video content without incident, and fast-pace gaming was acceptable at native and non-native resolutions.



$800, www.hp.com

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Planar PX212M

With its 21.3-inch screen, the PX212M is the biggest of the bunch, and it certainly cuts an impressive figure. The PX212M offers a telescoping neck for height adjustment and the screen rotates into portrait mode.

It also comes with an external power brick. We've come to expect the bulky add-ons from super-slim displays—which offload some internal componentry to achieve a svelte profile—but the PX212M is a big monitor, and we'd prefer to avoid the extra clutter. Of course, that's just a minor nitpick.

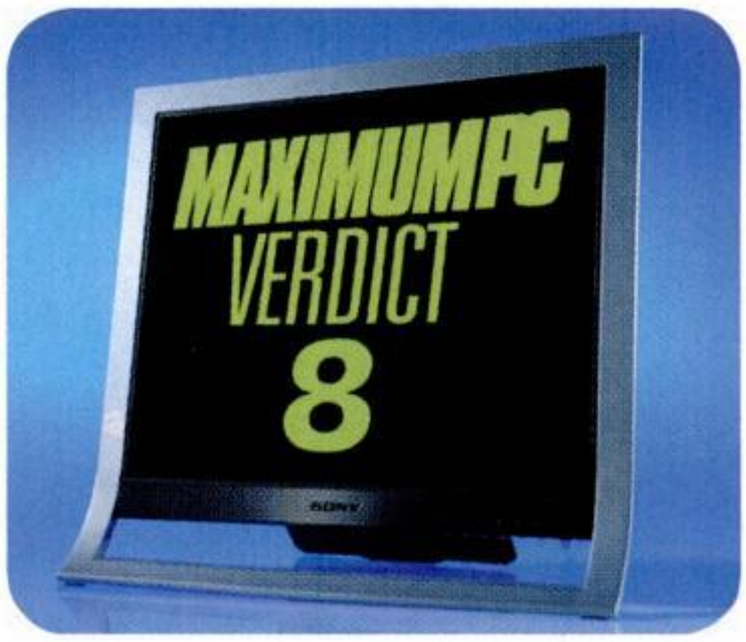
The screen's abilities are far more important. While the PX212M's black level was acceptable, signs of internal light at both the upper-left and lower-right corners lit the screen, even when all pixels were black. A few slight horizontal bands disrupted the screen's uniformity in our solid-color test screens. In the gray-scale ramps, the distinction between shades fell apart at the dark and light ends when the screen was tasked with reproducing more than 128 steps—similar to the L2305. Furthermore, the PX212M's off-axis image quality was poor by comparison.

We also noticed a slight anomaly in our *Need for Speed* "DonutMark." The exhaust smoke was more opaque on this LCD than it appeared on the reference CRT. This could be a manifestation of the aforementioned gray-scale weaknesses, where a loss of spectrum makes the light gray smoke appear more opaque. Aside from that minor complaint, gaming at native and non-native res was acceptable.

$1,150, www.planar.com

Sony SDM-HS95P

Sony's 19-inch LCD features a unique "rising design." At its maximum height, the screen has a 90-degree orientation; push down on the display and the angle of the spring-loaded stand widens, lowering the height of the LCD and simultaneously adjusting the tilt of the screen (up to 20 degrees). What bothers us about this is that a) the height can't be altered by much more than an inch, and b) you can't adjust the height and tilt independently. The SDM-HS95P also sports a super-glossy screen with no anti-glare or anti-reflective coating. This screen creates a mirror-like surface, which is distracting when viewing dark content or images that contain large swaths of solid color, or when viewing content off-axis. On the other hand, the high sheen makes for a bright, vibrant picture. Indeed, our Shoot Out images looked outstanding on the SDM-HS95P, with colors that appeared more brilliant than on the typical, treated LCD screens.



In our *T3* test, the onscreen action competed for our attention with the environmental reflections. To view dark content we had to extinguish all lights in the lab. Our experience with the nocturnal *Need for Speed* was similar, but the display's performance with fast-motion content was problem-free.

In *DisplayMate*, the most noteworthy flaw was the SDM-HS95P's inability to produce a decent black. Even with the backlight turned all the way down, the SDM-HS95P's dark screen was lighter than that of many of its peers. And turning down the Brightness more than 50 percent wiped out too many shades of gray.

$700, www.sonystyle.com

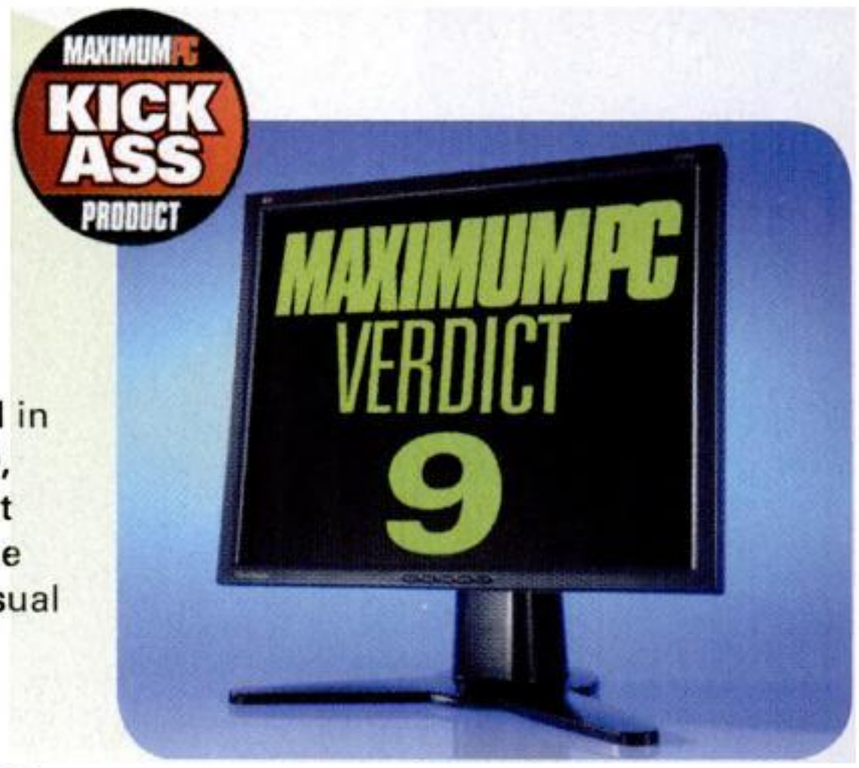
Viewsonic VP191b

Viewsonic's VP191b 19-inch display is similar to Philips' 190P5. That's a very good thing! Like the Phily, the VP191b is wrapped in a simple, black cabinet; it features the telescoping neck—which we oh-so-love—as well as all manner of swivel and rotate functions. Its OSD buttons are comprehensive, up front, and easy to master. But most significantly, like the 190P5, the VP191b blew us away with its performance. In some tests, it even trumped the Philips.

The VP191b display produces a deep, dark black—without revealing any signs of backlight. In our *DisplayMate* tests, the VP191b reproduced our gray-scale ramps of all ranges to a T, and each looked smooth as buttah. In fact, while we found the Philips 1905P "almost identical" to our reference CRT in this respect, the VP191b was spot-on, without the smallest hitch or slightest seam interrupting the transitions between neighboring shades.

The display performed equally well in our real-world tests. From the *T3* DVD, to the HD video clips, to the Shoot Out digital images, the VP191b spanked the competition. We couldn't even find visual artifacts in our gaming test.

The VP191b shares something else with the Philips: a 9/Kick Ass verdict. While the VP191b had slight advantages in some areas, we found the color of Philips' 1905P slightly richer and more pleasing. Regardless, you won't be disappointed with either monitor.



$560, www.viewsonic.com

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BenQ FP91V+

Our experience with BenQ's 19-inch FP91V+ started off on a bad foot, and then turned into a gangrenous leg. From its abominable port placement—squarely behind the neck—to the display's crippling non-adjustability, this display leaves damn near everything to be desired.

The FP91V+ can't be raised or lowered, nor can it swivel. It can only be tilted forward and back about 20 degrees. Then there's the backlight, which seeps through the entire screen's perimeter. Like Sony's SDM-HS95P, BenQ's LCD has a mirror-like surface, which exaggerates every leaked photon. We turned the brightness way down, which helped us achieve a more consistent, though never totally uniform black level. In the gray-scale ramps, the FP91V+ showed signs of kinks and banding across the entire spectrum once it had to produce 64 or more steps of gray, making it the weakest performer in our roundup. When the screen was filled with a solid color, it was riddled with blotches.

In our real-world tests, the colors appeared oversaturated and harsh. And the FP91V+'s gray-scale problems were manifest when the display had to produce subtle variations in shade, such as with skin tones or a large expanse of sky. What should have been smooth transitions looked blotchy. We also noticed artifacts in our *NFS* evaluation; when the car was spinning at high speeds, we could detect blockiness in the pixels of the exhaust smoke.

$550, www.benq.us

Eizo L778

We could do without the L778's funky bezel, stippled surface, and protruding side speakers, but we can forgive a few dubious design choices when a screen performs as well as this one.

Out of the box, the 19-inch L778 had the best black level—deep and dense as ink, and uninterrupted by any internal light, even at maximum brightness! Gray-scale reproduction was superb, no matter the number of steps or the variations in light intensity.

It was no surprise then that the L778 displayed all of our real-world content admirably, besting even the Philips in image quality. The contrast between lights and darks was incredible—making the picture appear to leap out of the screen. This is likely the result of Eizo's "C-Booster" technology, which monitors the gradation ranges of content and dynamically boosts the contrast range used most frequently.

There are a couple of niggling things that keep this monitor from perfection, though. The so-called ArcSwing neck, which telescopes along an arc rather than straight up and down, doesn't have quite the height range of the competing displays. Much worse, the L778's OSD—which features a full complement of options—is controlled by no fewer than 9 tiny black buttons. These buttons reside in the shadow between the screen and the recessed bezel, where it's virtually impossible to make out their ever-so-tiny, etched labels.

Make no mistake, the L778 is good, but a few changes could make it infinitely better.

$850, www.eizo.com

Formac 2010 Extreme Gallery

We were skeptical of the 20-inch Formac 2010 from the start. We didn't like its wide Lucite frame, and its kickstand method of adjusting screen position sucks. But we were much more concerned that there are barely any options for adjusting the image, other than a minimal backlight adjustment.

Fortunately, the 2010's internal calibration is pretty darn solid. Tested alongside the other 20-inch, 1600x1200 LCDs here, the 2010 had the best gray-scale range, with clear distinction between steps at both of the extreme ends. What's more, we were unable to detect errant spots of internal light when the screen was black. But the 2010 isn't flawless. When the screen was swathed in a low-intensity shade, it revealed faint blotches in spots, perhaps the result of an uneven backlight. Granted, this is the kind of thing that's virtually irrelevant to performance in most real-world content; and true enough, both still and moving digital-image samples looked fantastic on the 2010's screen. In our gaming tests, the 2010 handled action in its native and non-native resolution capably.

Be that as it may, we can't endorse a product that's this intrinsically limited. There isn't one universal standard dictating the proper degree of image contrast, color balance, or even color temperature that suits all types of content. And even if there were, the lack of controls leaves no room for personal preference, which a consumer should be able to exercise when he or she pays good money for a display.

$800, www.formac.com

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AT A GLANCE: THE SPECS

Model	Screen size	Native resolution	Pixel response time	Inputs	Power Supply	Verdict	Price
BenQ FP91V+	19 inches	1280x1024	12ms	VGA, DVI	Integrated	5	$550
Eizo L778	19 inches	1280x1024	16ms	DVI, VGA, 2 USB 2.0, Audio	Integrated	9/Kick Ass	$850
Formac	20.1 inches	1600x1200	15ms	DVI	Power brick	7	$800
Hewlett-Packard L2035	20.1 inches	1600x1200	16ms	VGA, DVI, Composite, S-Video	Integrated	8	$800
LG L1980Q	19 inches	1280x1024	8ms	VGA, DVI	Power brick	6	$795
Norcent LM-960	19 inches	1280x1024	25ms	VGA, DVI	Integrated	7	$450
Philips 190P5	19 inches	1280x1024	16ms	VGA, DVI, Audio	Integrated	9/Kick Ass	$580
Planar PX212M	21.3 inches	1600x1200	25ms	VGA, DVI, S-Video, Composite, Audio	Power brick	7	$1,150
Samsung 193P	19 inches	1280x1024	20ms	VGA, DVI	Power brick	9	$650
Sony SDM-HS95P	19 inches	1280x1024	12ms	VGA, DVI	Integrated	8	$700
Viewsonic VP191b	19 inches	1280x1024	16ms	VGA, DVI	Integrated	9/Kick Ass	$560

What We Learned

Most of the LCD monitors featured here would satisfy even discerning power users. With few exceptions, these screens are capable of displaying the gamut of real-world content in glorious living color. Our testing demonstrated that LCDs have conquered their gaming demons, once and for all. The few visual artifacts we saw in games were minor, and probably would have been imperceptible without the benefit of side-by-side comparison.

That said, we spotted several obvious stars in our lineup. Both **Philips' 190P5** and **Viewsonic's VP191b** offer an exquisite LCD experience—the whole package, if you will, of excellent screen quality and user amenities—all made even sweeter by a low price. Yet, fine as they are, it's possible to have an even better picture with **Eizo's L778**. With an unparalleled black level, breathtaking contrast, and eye-popping color, the L778 offers supreme image quality; the tradeoff is a higher cost and slightly less convenient design. ■

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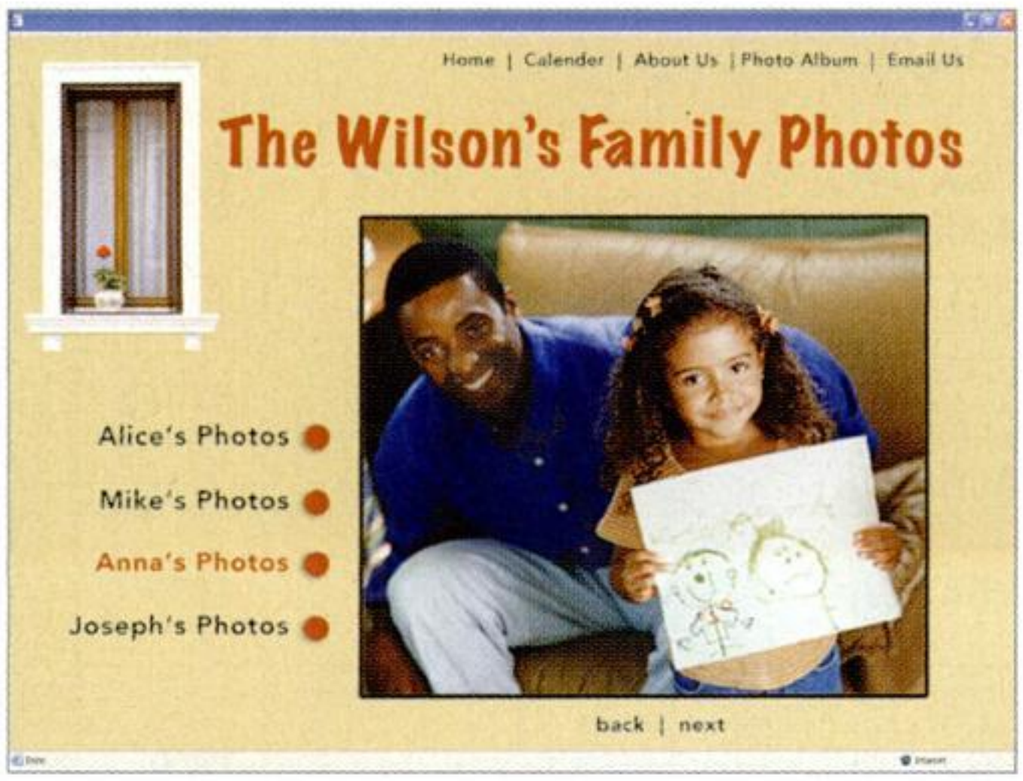

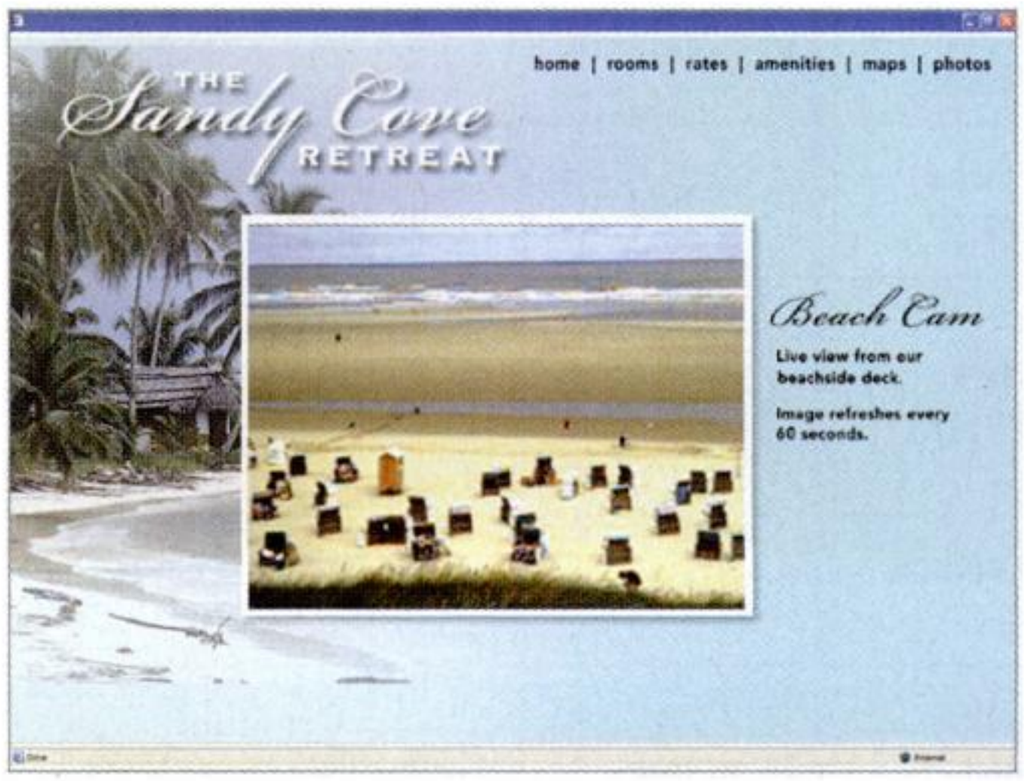

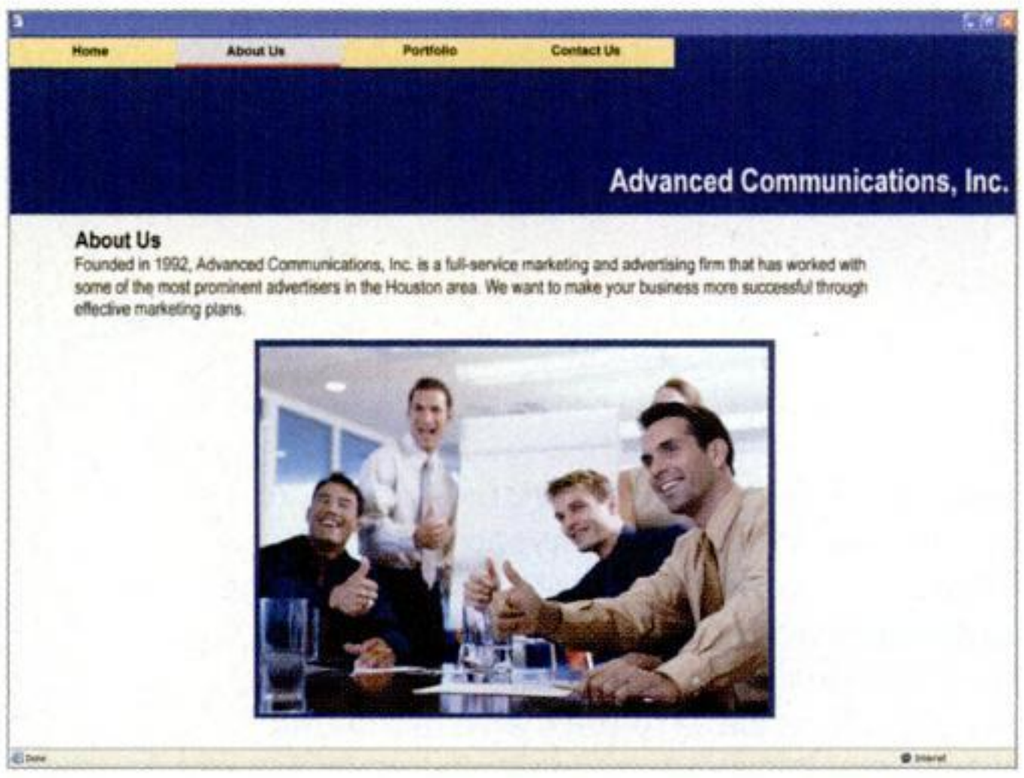

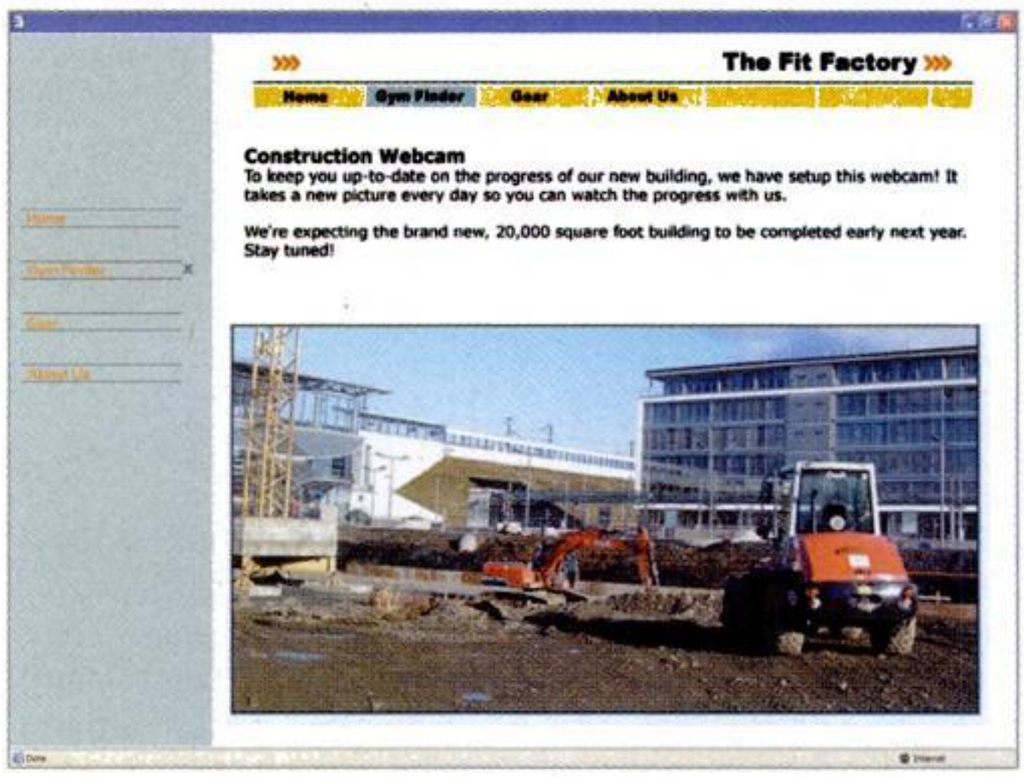

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Software suite worth $600	✓	✓
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Active Server Pages	–	✓
DOMAIN NAMES		
Included Domains	1	1
Subdomains	10	10
Run multiple independent sites	✓	✓
Full DNS management	✓	✓
E-MAIL		
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Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
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Virus protection for all accounts	✓	✓
SECURITY FEATURES		
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TAMING THE SATA BEAST

BY JOSH NOREM

photography by Mark Madeo, composited by Boni Uzilevsky

SATA 150, SATA II, SATA 3G? Suddenly, the hard drive spec that was supposed to simplify our drives has complexified our lives! If you want to tame the SATA beast, you must read this story

The parallel ATA connection standard for hard drives and optical drives has enjoyed an unusually long tour of duty by PC standards, but it's clear that the old spec is ready for retirement.

PATA is called a "parallel" interface because multiple bits of data travel along the 40-pin cable simultaneously on separate channels. But the parallel ATA interface tops out at a maximum transfer rate of 133MB per second, due to crosstalk. Crosstalk occurs when electrical signals on adjoining wires interfere with one another. It's like trying to have a conversation with a friend on a crowded bus while the dumbass sitting next to you is yelling into his cellphone. Because you're sitting so close to Mr. Cellphone, you can only hear his conversation, so you have to talk louder to make *your* conversation heard. But then *he* starts talking louder on the phone, and pretty soon neither of you can hear anything and everyone else on the bus is pissed off. That's crosstalk, and trying to push data through IDE cables faster just generates too much of it. And because the lasagna-size parallel cable is already too large and unwieldy to accommodate good airflow in today's PCs, an even wider cable just isn't an acceptable solution. Fortunately, there's another way to push data at extremely high rates while eliminating the crosstalk problem: Serial ATA.

Serial ATA to the Rescue

Instead of adding more parallel wires and channels, Serial ATA eliminates the problem of crosstalk by using an interface that pumps data through a single channel one bit at a time. Without the worry of electrical crosstalk, these bits can be pushed along the serial cable much faster than across parallel ATA.

The Serial ATA cable uses seven wires, three of which are ground wires, with the other four carrying data. Two of the data wires are dedicated to moving data from the computer to the hard drive (downstream), and two are dedicated to carrying data from the hard drive to the computer (upstream).

THE PAYOFF

Serial ATA does much more than just speed up your drive interface, however. Here are some of the other advantages of the Serial ATA spec.

This first-gen SATA drive from Maxtor used a parallel ATA-to-Serial ATA bridge chip. Now that SATA is becoming the norm for hard drives, most manufacturers have switched to a "native" SATA design.

➤ SMALLER CABLES

With only a couple channels worth of wires inside, Serial ATA cables are slender and almost sexy. SATA cables can also carry the signal much further than a parallel ATA cable—a little more than three feet compared with PATA's measly 18 inches.

➤ ALL DRIVES ARE EQUAL

Serial ATA wisely eliminates the silliness of having to set drive jumpers to Slave, Master, or Cable Select. Because each SATA drive operates on its own channel, you don't have to configure the drives to share bandwidth. We're glad to kiss this ancient PC bugaboo goodbye.

➤ HOT SWAPPING

The SATA controller in most modern motherboard chipsets (such as Intel's 915/925 family and nVidia's nForce4) supports hot-swapping SATA drives. You can plug them in when the system is running and they'll be instantly available for use.

➤ HIGHER VELOCITY

Not only does Serial ATA offer more bandwidth over parallel ATA right out of the box, but it also has plenty of room to grow. There's already talk of transfer rates up to 600MB/s, though the SATA roadmap indicates we won't be enjoying speeds this fast until 2010.

The parallel ATA interface (right) looks positively ancient next to its Serial ATA successor.

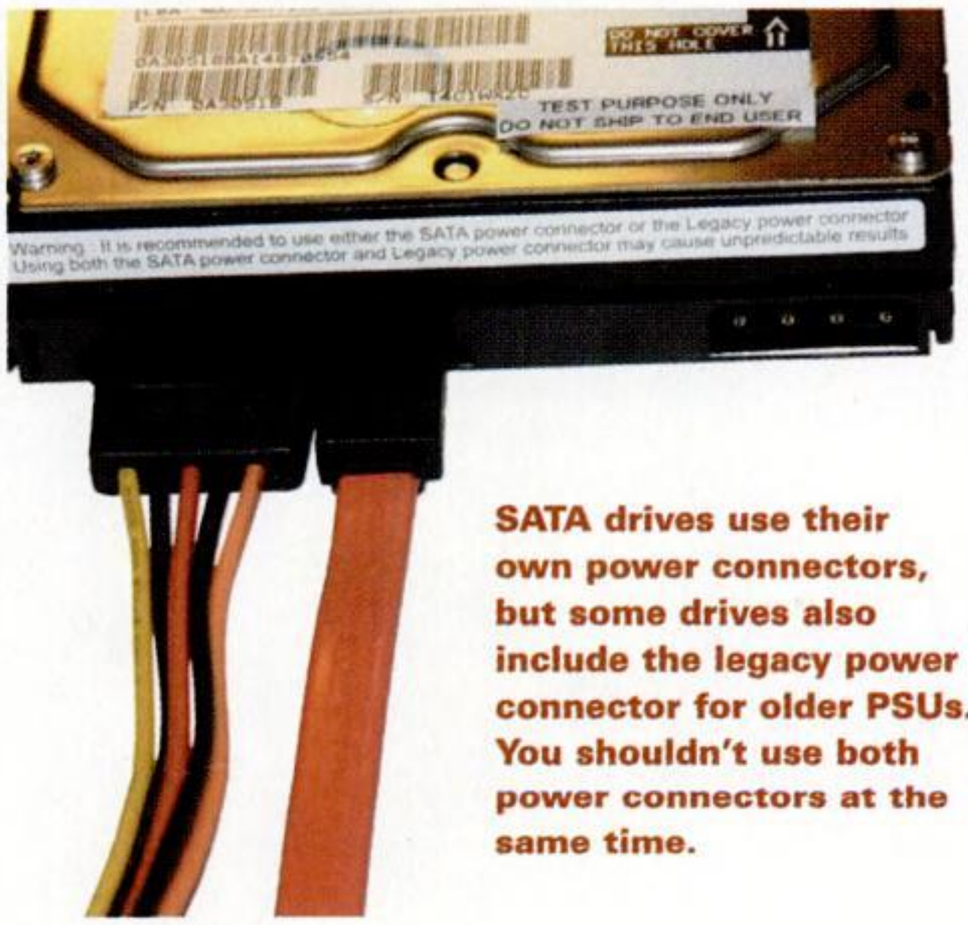
MEET THE SATA FAMILY

There are a lot of kooky terms being bandied about by hard drive manufacturers, SATA controller manufacturers, and Bob from down the street. Here's the full scoop so you know what to expect from current and next-gen SATA specifications.

Serial ATA 1.0

The initial rollout of Serial ATA was modest. Serial ATA 1.0, as it has become known, included no advanced features; it was a simple proof-of-concept introduction. The lack of adventurous features helped keep production costs low and encouraged adoption by both manufacturers and end users. In fact, despite SATA's debut, most hard drive manufacturers continued to sell parallel ATA drives—and still do to this day—but appeased early adopters by tacking a parallel ATA-to-Serial ATA bridge chip on some of their parallel drives. This worked reasonably well, but that's only because no drives are fast enough to saturate the ATA/100 bus. Sadly, the switch to SATA has had a minimal impact on performance. Despite the dearth of real-world performance gains, rabid upgraders have tossed out their old, crusty ribbon cables in ceremonies akin to the bra burnings of the 1960s and made the switch to Serial ATA.

The first generation SATA drives use a 150MB/s interface, so its official designation is SATA 150, not SATA 1.0.



SATA drives use their own power connectors, but some drives also include the legacy power connector for older PSUs. You shouldn't use both power connectors at the same time.

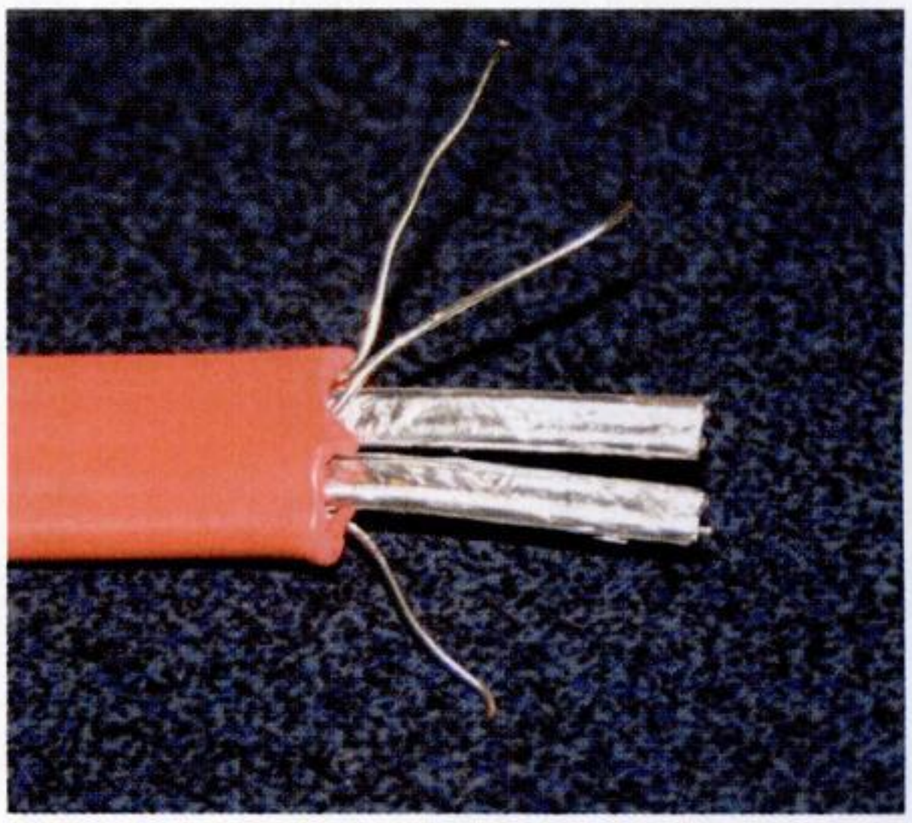
SATA 3G

This is the name for the second generation of Serial ATA drives, and the label refers to their increased bandwidth—from 150MB/s to 300MB/s, or 3 gigabits (Gb). As few of us have the time to say "3 Gigabit" these days, the name has been shortened to a hip-sounding "3G." In order for the interface to run at full speed, a 3G SATA drive must be paired with a 3G host bus adapter; otherwise, it will run at just SATA 150 speed. Keep in mind that this doubling of available bandwidth will *absolutely not* result in a doubling of drive performance. Faster SATA increases the speed of the connection between your drive and your system, not the speed of the drive itself. Even the fastest SATA drives today only saturate the SATA 150 bus in special circumstances, so this speed bump is a simple widening of a channel that is barely full to begin with. As of press time, the only 3G interfaces available are on the new nForce4 chipset from nVidia and the 955x chipset from Intel.

Serial ATA II

SATA II is not a type of drive interface, but instead a list of features that may or may not be supported by the second wave of SATA drives. Almost all SATA 3G drives will support the most common SATA II features (listed on the next page), but it's possible for a SATA 150 drive to support them as well. And to make matters even more confusing, just because a drive is SATA 3G doesn't necessarily mean it supports SATA II features. The proper way to refer to a 3G hard drive with support for some SATA II features, at a cocktail party or society event, is as follows: "This is a SATA 3G drive supporting SATA II extensions." You'll dazzle everyone around you.

Unlike the first rev of the SATA connector, the new ClickConnect plug locks onto the drive or SATA port via a flange on its tip that must be depressed to release the plug.



Inside the SATA cable we see the three ground wires as well as the upstream and downstream data channels.

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TOMORROW'S SATA

SATA 3G drives are pulling into the parking lot, and almost all of them will support a gaggle of new SATA II extensions. This is only a partial list, however; we wouldn't be surprised to find more trimmings added to the SATA spec in the future.

➤ STAGGERED SPIN-UP

This takes the load off of the PSU when booting a multi-drive system. Each drive waits for its turn starting up, so that only one drive begins spinning up its platters at a time.

➤ INTERRUPT AGGREGATION

Rather than sending one interrupt after a single command has been executed, this feature lets a drive send them in batches to the host controller. So, instead of saying, "OK, I finished that command; send another," the drive can now say, "Hey, I just executed those 10 commands—can you send some more?"

➤ EXTERNAL SATA

Also known as "eSATA," this interface brings the speed of the internal SATA interface outside of the PC for the first time. The first iteration of the eSATA spec allows for cable lengths of up to six feet; drives should be on store shelves by the time you read this.

➤ XSATA

This is an improvement to the eSATA specification, and it allows for an even greater cable length of up to 24 feet.

➤ CLICKCONNECT

SATA cables pop out of their ports if you so much as break wind near your PC. This new ClickConnect SATA cable eliminates the problem by attaching a latch to the connector, much like the ones on Ethernet cables.

➤ PORT MULTIPLIER

The port multiplier lets multiple drives connect to a single SATA port. The most likely use of this technology will be to allow a single SATA cable to connect your PC with an external enclosure housing up to four hard drives.

➤ NATIVE COMMAND QUEUING (NCQ)

An NCQ-enabled drive is able to intelligently reorder commands it receives and execute them in the order it deems most efficient. It allows the drive to queue up to 32 commands and then execute them beginning with the data that's closest to the current position of the read/write heads, and finishing with the data that's furthest away.

NATIVE COMMAND QUEUING BENCHMARKS!

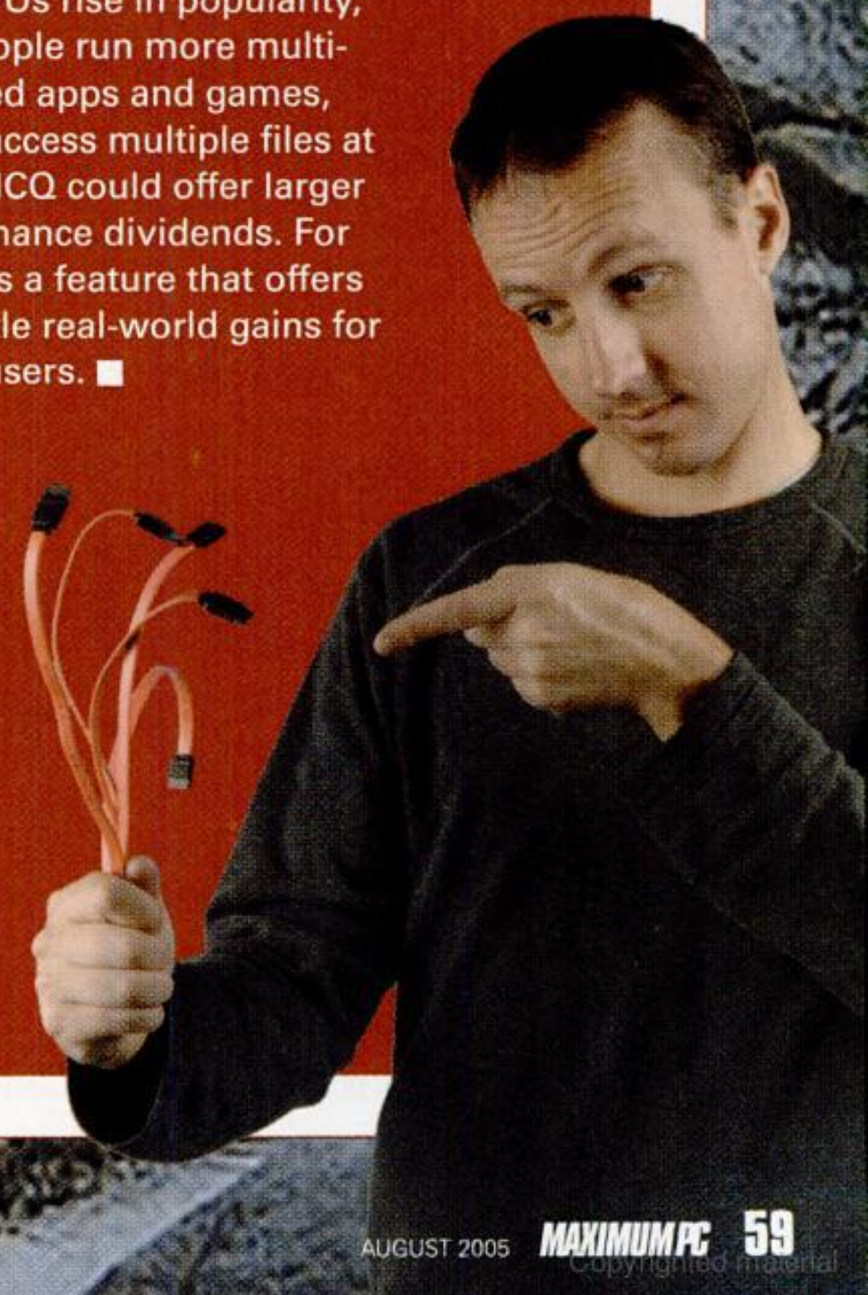
To test the performance benefits of NCQ, we tested two NCQ-compatible drives—Seagate's new 7200.8 and Maxtor's DiamondMax 10—along with a non-NCQ Raptor for comparison, on our nForce4 test bench. All tests were first run with command queuing disabled, and then with it enabled.

	7200.8	7200.8 NCQ	Dimax	Dimax NCQ	Raptor
HD Tach 3.0					
Access time (ms)	15.2	13.5	15.7	14.6	**8**
Avg. read (MB/s)	60.4	60.8	57.5	60.8	**64.6**
Burst speed (MB/s)	135	133	**138**	**138**	127
H2benchw					
Application index*	17.3	18.3	20.9	20.6	**24.4**
IOmeter					
100 percent random workload (I/Os per sec)	107	126	116	133	**261**
50 percent random workload (I/Os per sec)	196	216	212	235	**329**
Doom 3 loading (seconds)	34	34	33	33	**31**
5GB file transfer (seconds)	83	83	86	86	**81**

*Best scores are bolded. *The application index is the average time it takes a drive to chug through a script of workloads from six real-world applications. IOmeter tests were run with a file size of 512bytes with a queue depth of 32.*

OUR TAKE ON NCQ

As you can see, NCQ provides a small performance boost, though its effects are clearly more pronounced when dealing with a highly random workload, as in the *IOmeter* test. Unfortunately, highly random workloads rarely occur in a single-user environment. As dual-core CPUs rise in popularity, and people run more multi-threaded apps and games, which access multiple files at once, NCQ could offer larger performance dividends. For now, it's a feature that offers very little real-world gains for home users. ■



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How To... A step-by-step guide to tweaking your PC Experience

PROTECT YOURSELF FROM Phishing & Pharming

Don't be a sucker—protect your identity and your bank account

BY MICHAEL BROWN

If you've ever received an e-mail from PayPal, eBay, or a financial institution in which the sender asks you to log onto a website to confirm your online user ID and password, you've witnessed the handiwork of an Internet con artist.

These types of fraudulent e-mails are classified as "phishing" schemes, because crooks chum the waters with millions of pieces of spam, hoping a few fish will swallow the bait. The problem occurs when you click what you assume to be a legitimate link in the e-mail. Sure, it says "www.ebay.com," but the HTML code within the message masks the true destination: a criminal website hosted who-knows-where with the sole purpose of stealing your identity.

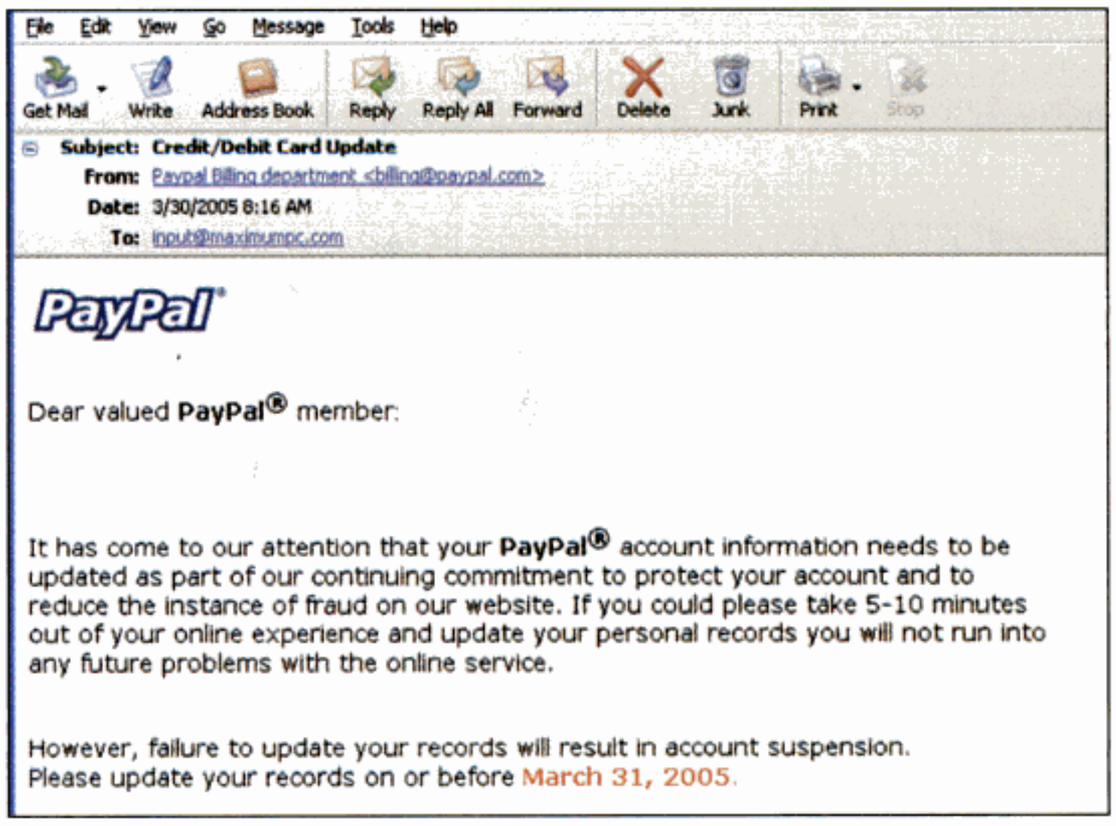
Pharming exploits often go hand-in-glove with phishing schemes, but the former can be much more difficult to identify—and thus far more effective. One of the most sinister pharming techniques exploits the vulnerability of the Internet's domain name system (DNS). The DNS translates web and e-mail addresses into a unique IP address. If a hacker manages to "poison" a DNS directory—altering it so that a familiar URL becomes associated with a string of numbers pointing to a fraudulent website—he can funnel thousands of unwitting victims into his clutches, even though the victims typed the correct URL into their browser.

Trojans are yet another insidious threat that can make pharming easier for hackers. The Banker trojan, for example, accomplishes the same goal as DNS poisoning by rewriting your PC's local host file. Because your web browser checks your local host file first—and the data in the local host file overrides the information contained in the DNS servers—a thief can direct you to a fake website and snatch your bank login, and you might not even know it until it's too late.

Be it phishing or pharming, the intent is to trick you into revealing your login ID and password, or to install spyware on your PC that's capable of stealing even more sensitive information. The good news is that you're not defenseless. The key is to practice safe surfing and to remain ever vigilant.

TIP 1 Don't Ask, Don't Tell

Here's one absolutely simple way to protect yourself from phishing schemes: Never, ever, *ever* respond to an e-mail query from a financial institution, auction site, or anyone else asking you to confirm your identity on a website. Legitimate organizations will never ask for this information via e-mail, so you should never reveal it.



For whatever reason, PayPal and eBay customers are among those most frequently targeted by criminals orchestrating phishing schemes.

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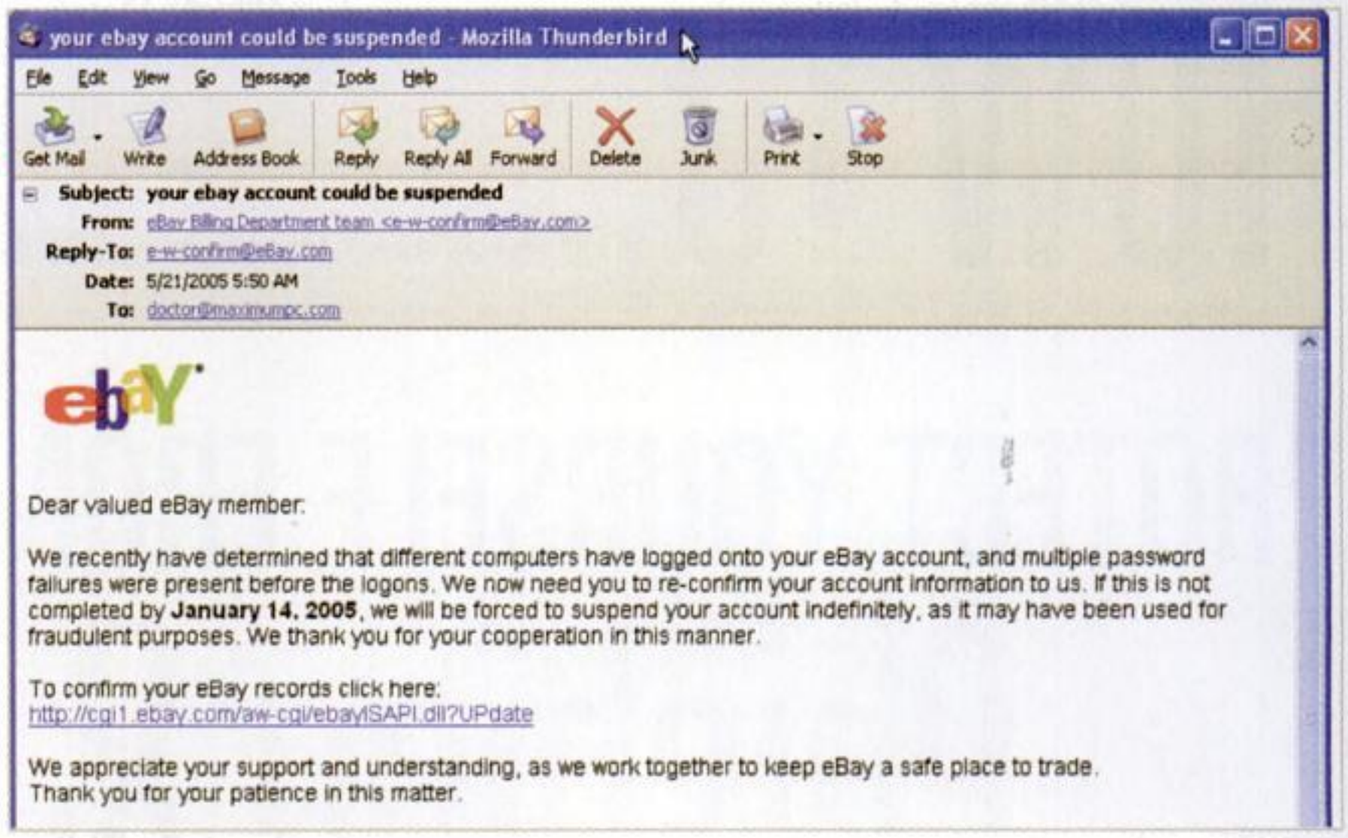
TIP 2 Know Your Source

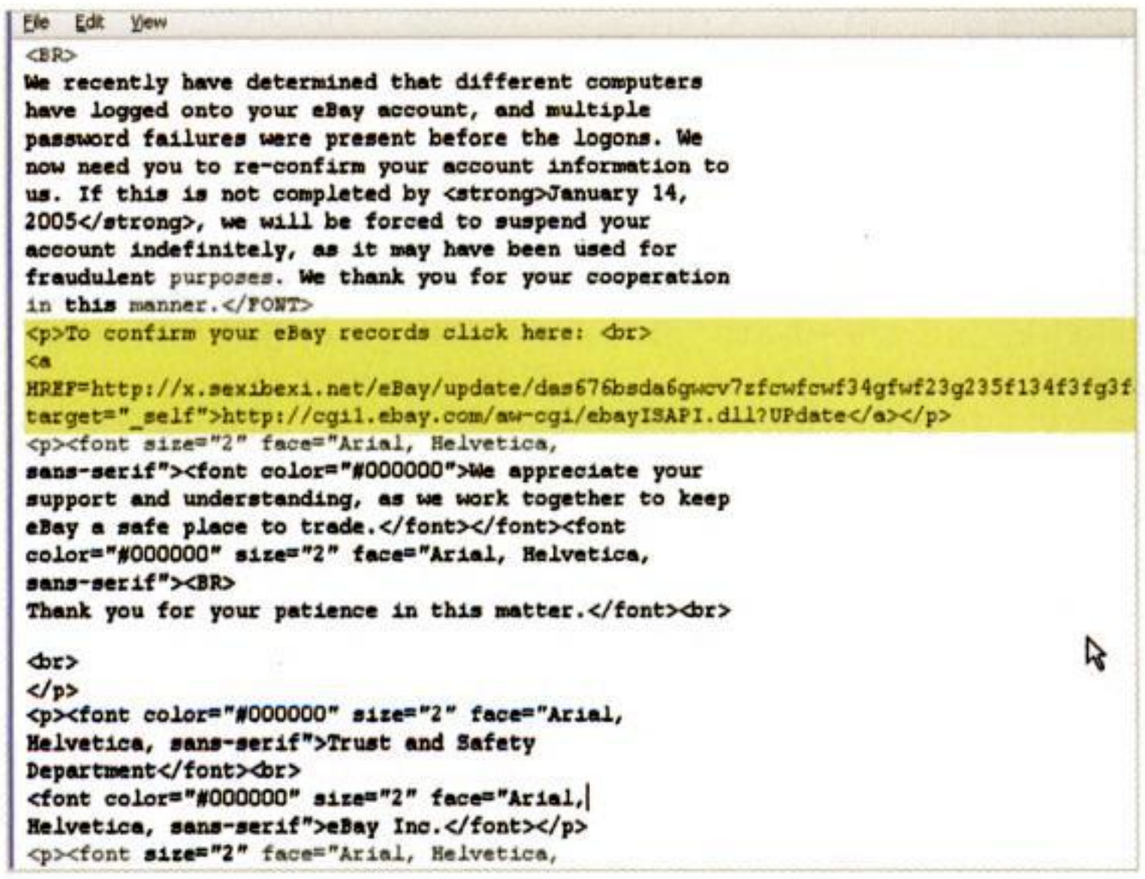
If you're not a customer of the financial institution or other company that's pinging you for information, immediately delete the e-mail. Hackers cast a wide net in the hope of catching a few victims.

TIP 3 Resist the Urge

Never click the hyperlinks contained in an e-mail, even if the correspondence looks perfectly legit; for that matter, even if the correspondence is legit. It's a habit you need to get into, because masking the URLs embedded in HTML code is child's play for a hacker or other malcontent. Type the URL into your browser, instead, and then bookmark the site for future reference.



Don't have an eBay account? That makes this e-mail mighty suspicious then, doesn't it?



```
File Edit View
<BR>
We recently have determined that different computers
have logged onto your eBay account, and multiple
password failures were present before the logons. We
now need you to re-confirm your account information to
us. If this is not completed by <strong>January 14,
2005</strong>, we will be forced to suspend your
account indefinitely, as it may have been used for
fraudulent purposes. We thank you for your cooperation
in this manner.</FONT>
<p>To confirm your eBay records click here: <br>
<a
HREF=http://x.sexibexi.net/eBay/update/das676bsda6gwcv7zfcwfcwf34gfwf23g235f134f3fg3f
target="_self">http://cgi1.ebay.com/aw-cgi/ebayISAPI.dll?UPdate</a></p>
<p><font size="2" face="Arial, Helvetica,
sans-serif"><font color="#000000">We appreciate your
support and understanding, as we work together to keep
eBay a safe place to trade.</font></font><font
color="#000000" size="2" face="Arial, Helvetica,
sans-serif"><BR>
Thank you for your patience in this matter.</font><br>

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</p>
<p><font color="#000000" size="2" face="Arial,
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Department</font><br>
<font color="#000000" size="2" face="Arial,
Helvetica, sans-serif">eBay Inc.</font></p>
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If you're ever in doubt about where the URL link in an HTML e-mail will *really* take you, use your e-mail client's reveal-source tool.

TIP 4 Fake Left

One way to reduce the chances of being taken in by a fraudulent website is to first provide a password you know to be false. If the site accepts the bogus password, you know there's something amiss.

TIP 5 Use Protection

Malcontents exploit browser vulnerabilities and use viruses to get your data. Keep your web browser and your antivirus software's virus definitions up to date at all times. Most virus software has an auto-update feature for this purpose. If you're using *Firefox*, you can configure it to check for updates either automatically or on demand: Click Tools, then Options, and then choose Advanced and scroll down to Software Update. To update *Internet Explorer*, click Tools, then Windows Update, and follow the directions on Microsoft's Windows Update website.

If You Get Hooked

As with all other criminal activities, phishing and pharming schemes will likely be around as long as there are Internet users to victimize. Fortunately, it's relatively easy to keep yourself out of harm's way. And if you're ever defrauded by a scam artist, you can minimize the damage by acting quickly.

Sound the Alarm

If you suspect you might have inadvertently given away your login and password to a service or financial institution, contact the company quick-like and inform them you were the victim of fraud—and change that password anywhere else you might have used it (although you shouldn't be using the same password in more than one place anyway).

Be A Narc

If you've surrendered personal information—credit-card info or your Social Security number, for example—ask the three major credit bureaus (Equifax, Experian, and Trans Union) to place fraud alerts on your credit file. Close any accounts you know or suspect have been tampered with. Report the incident to your local police department, complete with an ID Theft Affidavit, and file a complaint with the Federal Trade Commission. The FTC maintains a database of identity-theft cases—Consumer Sentinel—that law-enforcement agencies in the U.S., Canada, and Australia use in their investigations. If phishing and pharming schemes can't be eliminated, we can at least make things more difficult and costly for the cretins who orchestrate them. ■

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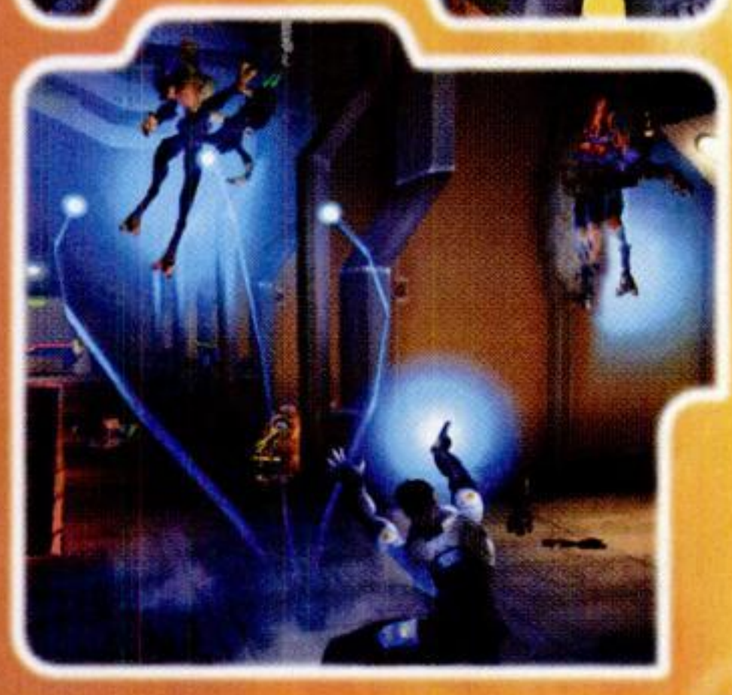

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Ask the Doctor

Symptom ▶ Diagnosis ▶ Cure

UNIVERSALLY SLOW BUS

I have an Asus A7V333 motherboard with an Athlon XP 2600+ processor, 1GB of RAM, and Windows XP Pro SP2 installed. The mobo has six USB ports, four of which are built into the board and two come from a slot at the bottom of the computer. The only USB ports that respond are the very top ports next to the PS/2 connectors, and they work only at USB 1.1 speeds. I have reinstalled all the drivers and updated my BIOS to the latest revision, which is well over two years old. I really do not want to replace the board, because who knows what Windows XP will do after that? Any suggestions?

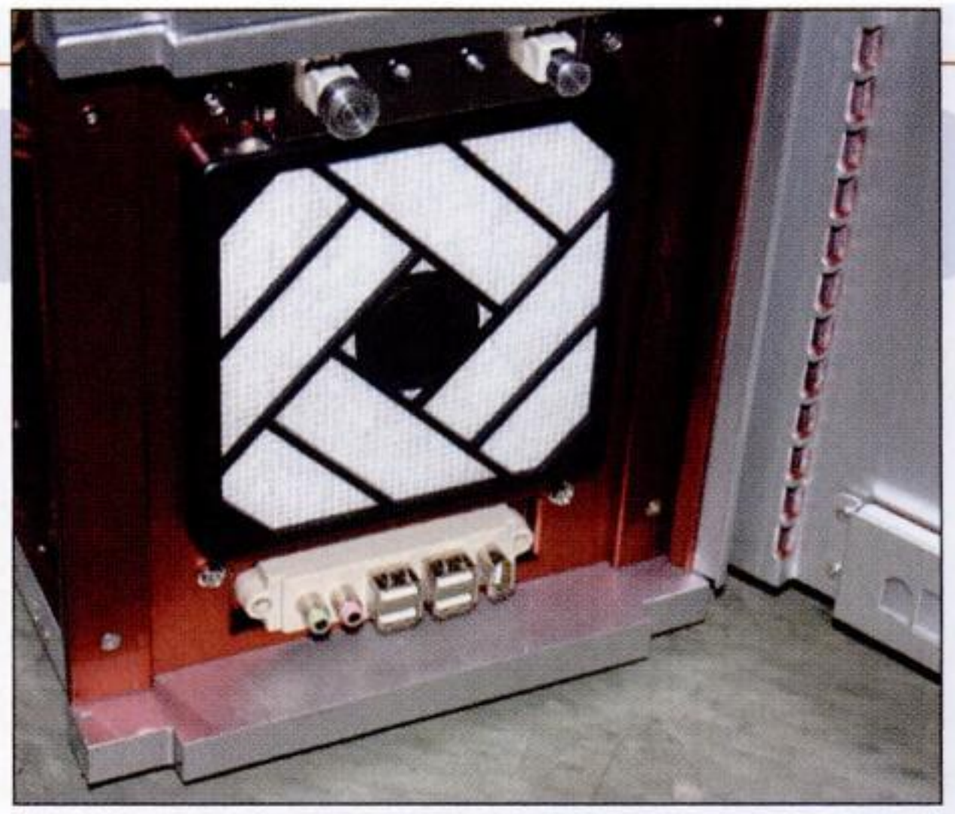
—JASON WATKINS

The A7V333 uses the VIA KT333 chipset and VIA VT82333 south bridge, which does not support USB 2.0. Thus, the two USB ports right next to the PS/2 ports are only USB 1.1. Asus compensates for the lack of native USB 2.0 with a VT6202 USB 2.0 controller that's been added to the motherboard. It sounds like the secondary USB controller might be disabled. To enable it, examine the jumper just below the fifth PCI slot. It should have the term "USB_EN" next to it. By default, the jumper should be set to 1 and 2, to enable the USB 2.0 ports. If it's been set to 2 and 3, the additional USB ports are disabled. If the jumper is set correctly (make sure it's not loose or broken), boot the machine and check its BIOS. Look at the PCI Configuration and make sure the USB function is enabled. When you boot into the OS, if all things are good, the OS should detect the USB ports and either ask you for drivers or use the built-in support in Windows XP SP1. If you've misplaced the manual for this motherboard, you can download it from either Asus' global website or its Taiwan site. For whatever reason, the manual doesn't seem to be available from the North American site.

DEMON DUST

I will be moving my computer to a room in which dust buildup might be a problem. Do you know of any cases that have a built-in filter? I've used Antec cases in the past, but the filter they provide isn't fine enough. I've also used air filter material in the front of the air intake fans, but I would really like to get a case with a good filter built in.

—CURT YOUNG



Silverstone's sexy TJ03 Nimiz enclosure includes a washable filter over the front intake fan, but you can make your own with products from the local grocery store.

Being the owner of several furry friends, the Doctor feels your pain, Curt. Luckily, there are a number of cases on the market that include air filters over the front intake fans in order to prevent pet dander and hairballs from being sucked into the works. Filtered fan bays are a premium feature, however, so they typically appear only on high-end cases. Our favorite is the Silverstone TJ03, which has a removable, washable filter, as you can see here. We've also seen filters on Thermaltake's Armor series cases; and Cooler Master's new Praetorian 730 includes a removable filter, too.

If you don't want to spring for a whole new case, you can always make your own filter. Pick up a sheet of porous foam at the local hardware store, and attach it to either the fan or the inside of the front bezel. This will filter the air before it reaches the fan. Another inexpensive solution is to buy a box of Swiffer cloths. Cut them to size and tape them over the fans—they're like dust magnets, and you can toss them out when they're full!

YES, BUT WHICH P4P800?

I'm having trouble getting the Ethernet connection on my Asus P4P800 motherboard to function. I can find no other identifying marks on the board, but Asus' website lists about five or six different P4P800 motherboards. I've tried the Ethernet drivers for all of these models, but I can't get the LAN to work—it's displayed in the device manager with a yellow exclamation point next to it.

—D. THOMAS

If the motherboard has a silkscreen label identifying it as a model P4P800, it's most likely the original P4P800 mobo (which is not to be confused with the P4P800 Deluxe, P4P800-E Deluxe, P4P800 SE, P4P800-X, P4P800S-X, P4P800S, P4P800S, P4P800-VM, or the P4P800-MX. *Whew!*) You should download the drivers for a 3Com 3C940 part from Asus' website. The NIC is probably enabled, because it's showing up in your device manager—that means it's likely a driver problem. Be sure to download the correct drivers for your exact board, as the LAN components might differ among the plethora of P4P800 mobos.

POWER CORRUPTS

I built my first PC a few months ago, and things were fine for a while. Over the past few months, however, I've experienced problems with crashes not only during gaming sessions, but also during regular use (e.g. surfing the web, and so on). My monitor will go blank and I'll hear high-pitched sounds coming from my speakers until I shut the system down via the power button. I thought the problem might stem from an overheated videocard, but the temperatures seem to be fine. I am running a lot of hardware, including two Raptors, a GeForce 6800, and seven case fans, so my next guess was related to the power supply. To test that theory, I unplugged everything except for the graphics card and the hard drives; sure enough, the system stabilized for a while. I had to use an optical drive one day, so I plugged it in and the system crashed. I unplugged it, and Windows worked fine; but even with everything disconnected, I still get an occasional hard crash. Is it a safe guess that my 500-watt MGE PSU has a bad power rail or two? Or could it be something else?

—DANTE JONES

It sounds like you've done a good job of troubleshooting, and I

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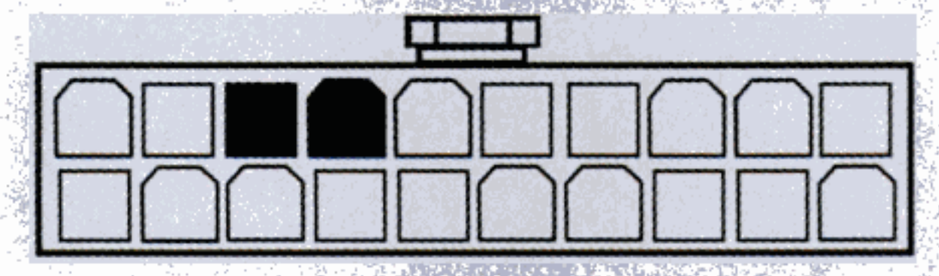
DOING RUBE GOLDBERG PROUD

I recently built a new system with an Asus A8N-SLI Deluxe board and a PC Power and Cooling Turbo-Cool power supply. I'm running about a dozen hard drives, half of which hold recorded TV programs from my PVR. Because I watch these programs only occasionally, I added a second power supply that will power these six drives only when I switch it on, saving a little electricity. Although I've connected these drives to the new power supply, and I switch it on when I switch on the primary power supply, the drives do not appear to be getting power. The drives work fine when connected to the primary power supply. What have I missed?

— TOM KELLY



In order to manually turn on an ATX power supply, you'll need to short these two pins on the main power connector and then build a switch.

Unlike ancient AT power supplies, ATX power supplies are switched on from the motherboard. The switch on the back of the power supply only toggles power going into the unit. To be manually turned on, the ATX power supply must be "shorted" by joining two pins on the main power connector. You can short the two pins and build in a switch to turn the PSU on or off. A simpler solution might be to configure the drives to spin down when not in use.

WHO'S IN CHARGE HERE?

I just transferred my operating system to my brand-new Raptor—which is all that with a side of fries, by the way—but when I try to use Windows' built-in Defragmentation tool, I receive an error message claiming that Chkdsk /f is "scheduled." Is that normal when a new disk is introduced to Windows, or what? I just tried again and now the utility is able to analyze the drive, which is not yet fragmented anyway, but still I'm curious: Who scheduled this Checkdisk operation? Not me.

—IOTEST

Your operating system scheduled the Chkdsk operation. It might have encountered an error or some bad sectors when you were transferring your OS to the new drive, and when this happens the OS automatically schedules its drive diagnostic utility, named Chkdsk, to run on the next reboot and fix whatever errors it finds (that's the "/f" part of the command). You've likely seen this activity before. When your PC crashes, Windows will often automatically examine the hard disk for bad sectors upon reboot. If you ever encounter weirdness and want to schedule a Chkdsk yourself, click the Start menu, choose Run, and type "chkdsk /f" in the box. The next time you reboot your system, the operation will run. If you'd like to see which, if any, tasks are scheduled, click the Start menu, choose All Programs > Accessories > System Tools > Scheduled Tasks. You can cancel scheduled tasks here, too. ■

agree with your diagnosis that the problem probably stems from your power supply. The GeForce 6800 is a power hog, especially if it's the Ultra model (the AGP version of which requires *two* power connectors). Before you toss your PSU, though, you should verify that you've properly wired your components. You don't want to power your hard drives using six Y splitters, for example. The power cables running to your videocard should be dedicated lines, too. You should also make absolutely sure your problems aren't being caused by a simple ventilation issue or a bad stick of RAM. To eliminate those variables, run the software utility *memtest86*, which is available for free (the authors accept donations) from www.memtest.org. There's an outside chance that bad RAM coupled with a borderline-underperforming power supply could be the culprit.

NEVER TELL ME THE ODDS

I ordered a PC through my IT department and specified ECC RAM for an Asus A8V. When I received the computer, the ECC was disabled. I use programs that run for days or weeks at a time, and I don't like the idea of having to do something over because some bit flipped the wrong way. Getting the wrong answer is an even worse scenario. What are the tradeoffs with ECC?

— PAUL FERRON

ECC (error checking and correction) memory can fix single-bit errors and detect multi-bit errors. The technology has fallen out of favor for desktop applications, both because there's a slight CPU performance hit and because ECC memory is more expensive. Also, most people believe there's about as much likelihood of actually getting an error (from random radiation in our environment) as there is of surviving an attack on an Imperial Star Destroyer or successfully navigating an asteroid field. It just doesn't happen very often. And even if an error does occur, odds are you'll never notice it. Finally, many consumer-level chipsets are downright flaky with regard to ECC support, so why pay the extra bucks?

Having said all that, nearly all workstations and servers run ECC RAM. This is partially because workstations and servers are used for more "serious" applications than are regular desktop PCs. These machines are also typically outfitted with a lot more RAM and, especially in the case of servers, often run on 24/7 schedules. Because you're running programs for very long stretches of time, you should turn on ECC. It's unlikely that you'll notice a performance hit.

The Doc's got the cure for what's ailin' your PC. Drop him a line at **doctor@maximumpc.com** describing your symptoms, and he'll do his level best to whip up a remedy.

SECOND OPINION

In your June 2005 column, you recommended purchasing a PCI soundcard if it turns out the motherboard audio is causing feedback. I'm a bit surprised you didn't mention the option of USB audio. Granted, there seem to be limited sources (mostly from Creative), but there are a few others (including M-Audio).

One of the great advantages of using a USB adapter is that the circuitry is removed from the inside of the case and is thus much less prone to EMI. The computer case is (or should be) designed to reduce interference to the outside, but inside, it's dog-eat-dog. Of course, a PCI card is likely to be the cheaper choice and it may do the trick. But a good USB audio system is certainly worth considering. Plus, it should have better overall specs than most slot (or onboard) options, precisely because it doesn't have to deal with the cacophony inside the box.

—MIKE SOCK

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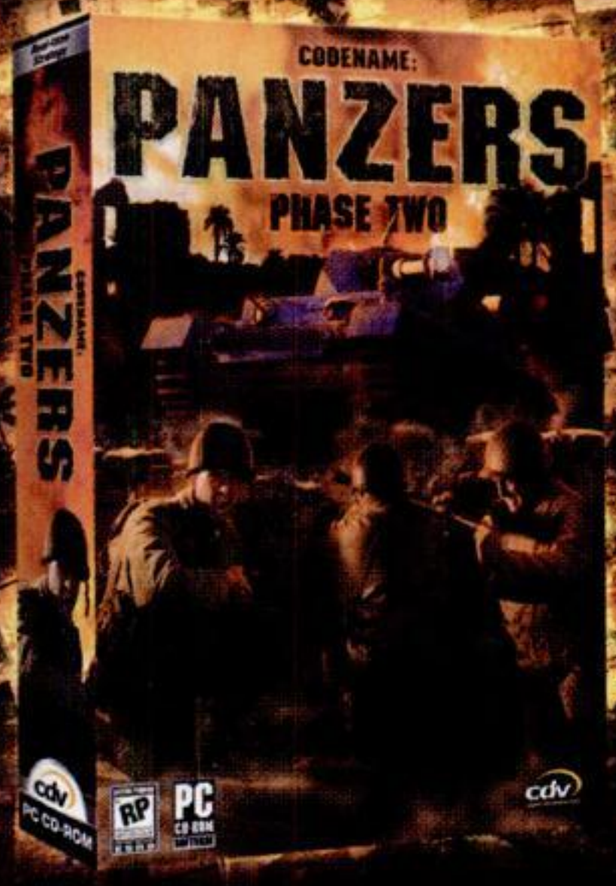
PANZERS

PHASE TWO

"A GOOD MIX OF FUN AND FACT
THAT CAN TRANSLATE INTO A FIRE FRENZY
OF EXCITEMENT ON THE BATTLEFIELD."
- IGN

"...CAPABLE OF ASTONISHING
ZOOMED-IN LEVELS OF DETAIL."
- GAMESPOT



FEATURING THE VOICE OF PETER WELLER
(*ROBOCOP™, BUCKAROO BANZAI©*)

- 3D GRAPHICS ENGINE RENDERS FIERCE RTS BATTLES IN EXQUISITE DETAIL.
- LEAD THE AXIS, ALLIES, OR YUGOSLAVIAN RESISTANCE ACROSS NORTHERN AFRICA, SOUTHERN EUROPE OR THE BALKANS.
- COMPREHENSIVE MISSION EDITOR ALLOWS PLAYERS TO CREATE THEIR OWN SCENARIOS AND MISSIONS.

ACTUAL IN-GAME SCREENSHOTS

RATING PENDING
RP Visit www.esrb.org for more Rating Information.
ESRB CONTENT RATING

PC CD-ROM

WWW.PANZERS.COM

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Stormregion

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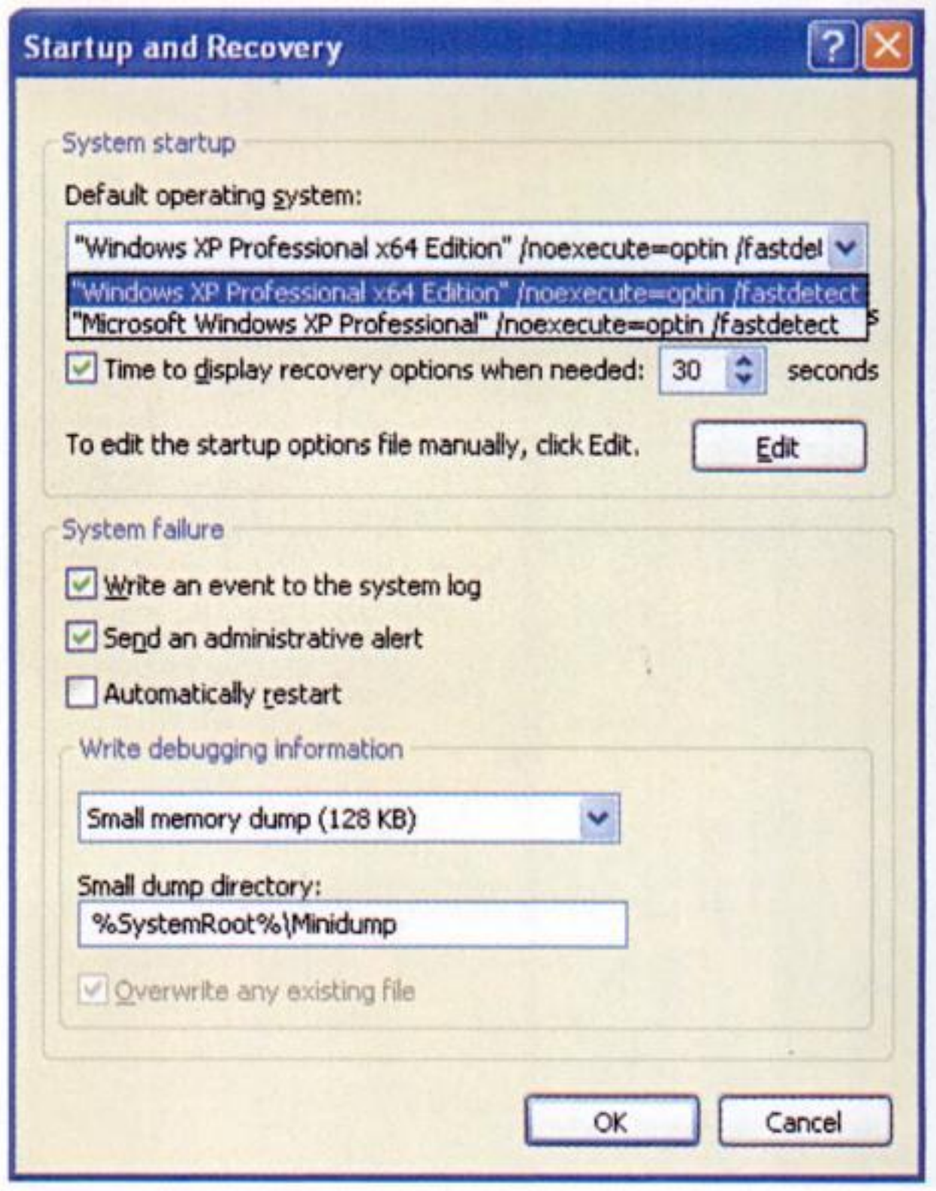
In the Lab

A behind-the-scenes look at Maximum PC testing

Real-World Testing: 64-Bit Windows

Installing and running Windows XP Professional x64 Edition



You can choose which OS you want to boot first by going to the Advanced tab in the System Properties control panel and changing the settings under Startup and Recovery.

So you just bought a copy of Microsoft's Windows XP Professional x64 Edition but you're not sure you're ready to run the 64-bit OS 100 percent of the time? We understand. While drivers for the new OS are now easier to find six weeks after release, some crucial drivers (for RAID controllers, printers, and scanners) are still AWOL.

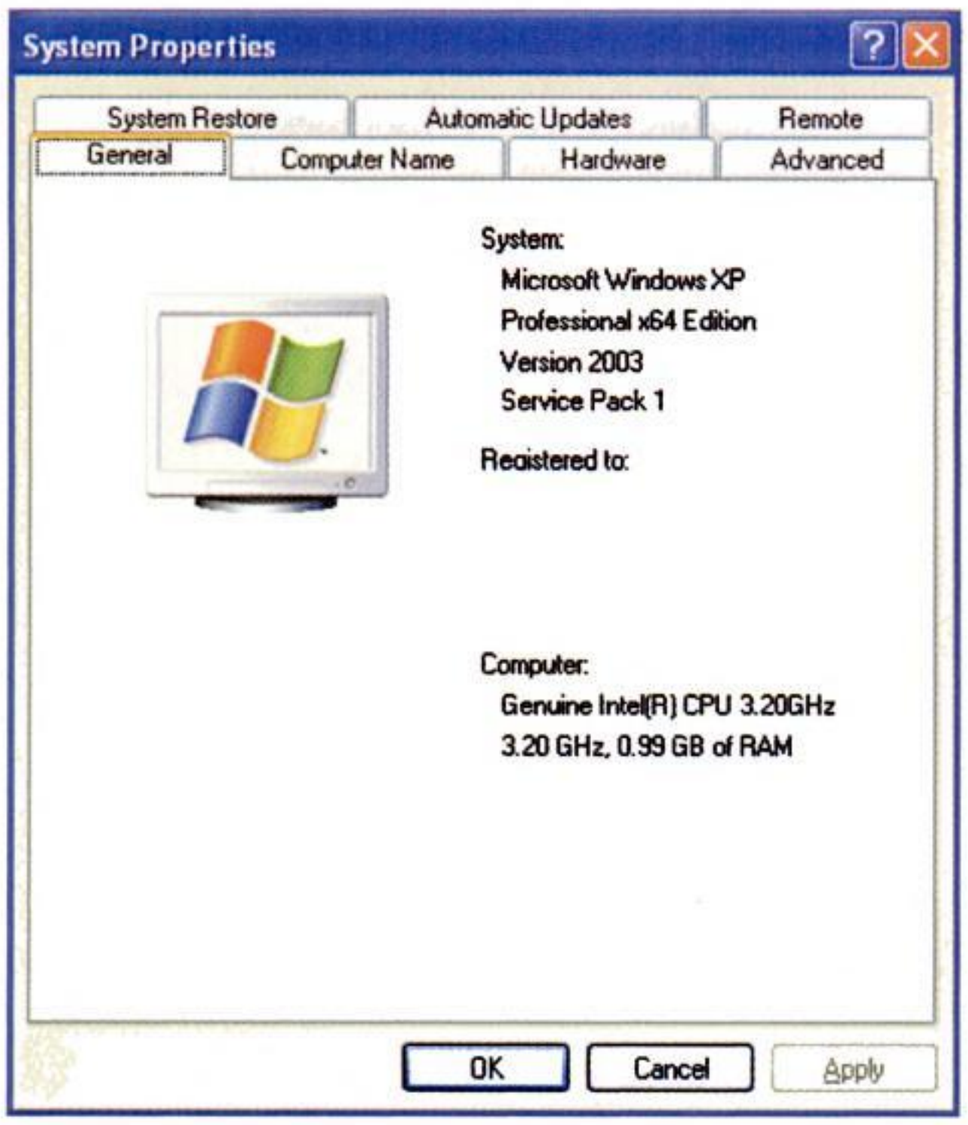
To avoid problems, at least until the OS is more mature, it makes sense to dual-boot your system. For applications and devices that can't run in x64 Edition, you can simply reboot your computer and use the 32-bit version of Windows. If you haven't done a dual-boot since the days of Win2K/ME, it's pretty easy. The key lesson is to install the OSes on separate partitions, otherwise you'll confuse your applications.

If you want to install x64 Edition to a drive that has only one partition, you'll need to decrease the size of that partition and create a second partition in the empty space using a tool such as Symantec's *PartitionMagic 8.0* (**www.symantec.com**). Once you've split the partitions, install x64 Edition to the second partition as you would normally install WinXP. If you're starting from scratch with a new hard drive and you want to dual boot, you generally install the newest OS last, so install XP and then x64 Edition.

Everyone knows Microsoft took a painfully long time to roll out x64 Edition, but it was definitely worth the wait. Our hands-on testing showed the OS to be amazingly stable. We didn't run into any compatibility issues when running our 32-bit test apps on x64 Edition, and for the most part, the overall experience was seamless. For kicks, we ran a couple of our 32-bit benchmarks—Adobe *Photoshop CS* and *3DMark05*—to see if there's any performance difference when using the 64-bit OS. Our test rig was a 3.2GHz Pentium Extreme Edition on an Intel 955X motherboard. (It gave us a good chance to verify that Intel's 64-bit support works as advertised. It does, and Intel has its drivers in order. The full set was available for the D955XBK motherboard.)

We went into our tests expecting slower performance from x64 Edition because the Windows-on-Windows emulation layer necessary for running a 32-bit program is bound to create lag. Sure enough, *Photoshop CS* ran slightly slower on the 64-bit OS. *3DMark05,* however, threw us for a loop. While the GPU test results were identical between the two OSes (as expected), the CPU benchmarks reported scores about 5 percent faster in 64-bit mode than in 32-bit mode. Interesting.

In the near future we'll compare the 64-bit performance of Intel and AMD, and at that time we'll use benchmarks—such as *Panorama Factory* (**http://panoramafactory.com**)—that are expressly designed for a 64-bit OS.



If there was any doubt that Intel's new CPUs support AMD64, errr, EM64T, they can now be laid to rest.

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Media Gear Keychain USB

TESTED & GEEK APPROVED

Got an old 256MB or 512MB memory card collecting dust? With Media Gear's Keychain USB, you can recycle those old, worthless flash memory cards. Media Gear makes adapters for Compact Flash, SmartMedia, SD, xD, and Memory Stick formats. For just $10, you can get those cards working for you again. In a pinch, you can even use the Keychain USB as a memory card reader for your digital camera when you're out in the field.

$10, www.mymediagear.com

Slappa Graphite 240

Ditch the craptacular Caselogic CD holder you've had since college, it's time to trade up. The Slappa hard-sided binder is built to last and it holds a whopping 240 discs, or 120 discs plus 120 CD covers.

$50, www.slappa.com

Best of the Best

As of August 2005

We thought our beloved 2001FP would be bumped by the panels in this month's LCD roundup, but the superb performance of Dell's monitor coupled with its 1600x1200, 20-inch screen keep it at the top for now. Meanwhile, we're dumping the GeForce 6600 GT in favor of the new ATI Radeon X800 XL. For just a few dollars more than the 6600, ATI's card offers a full 16 pipes. We're also still in a holding pattern on LGA775 mobos, but expect a recommendation soon.

PCI Express videocard:
ATI Radeon X850 XT Platinum Edition

Budget videocard:
ATI Radeon X800XL

Soundcard:
Creative Labs Sound Blaster Audigy 2 ZS Platinum

7,200rpm SATA:
Hitachi Deskstar 7K500

External backup drive:
Western Digital Dual-Option Media Center 250GB

USB drive:
Seagate Portable External Hard Drive 100GB

DVD burner:
Plextor PX-716A

Widescreen LCD monitor:
Hewlett-Packard f2304

Desktop LCD monitor:
Dell 2001FP

Desktop CRT monitor:
NEC FE2111 SB

Socket 939 Athlon 64 mobo:
Asus A8N-SLI Deluxe

Portable MP3 player:
Apple iPod 40GB

Photo printer:
Canon i9900

PDA:
Dell Axim X50v

5.1 speakers:
Logitech Z-5500 Digital

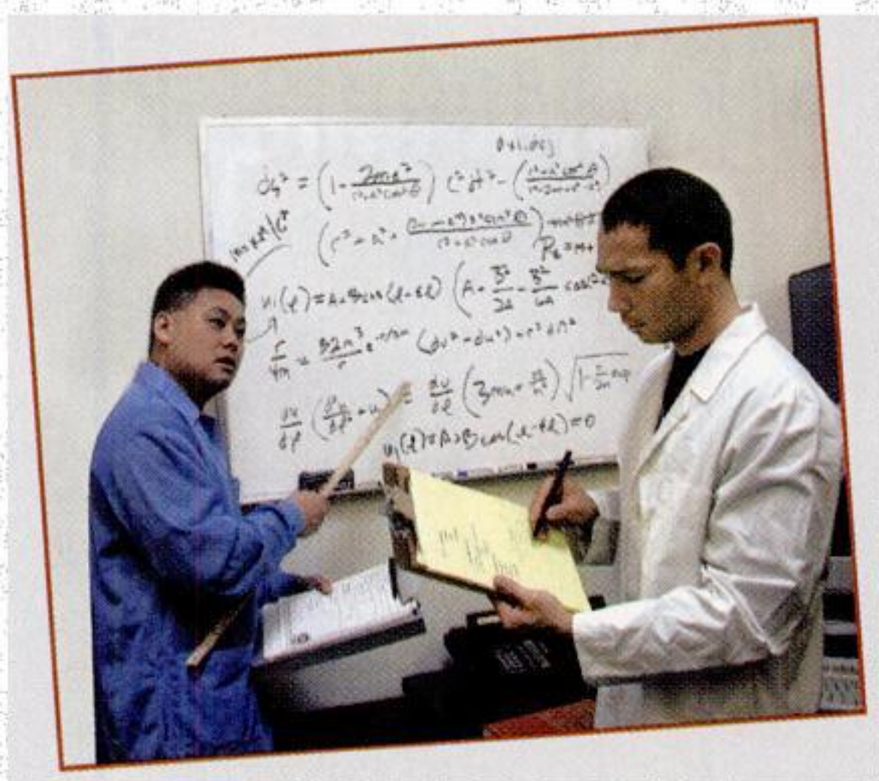
2.1 speakers:
Klipsch GMX A2.1

Mid-tower case:
Chenbro Gaming Bomb II

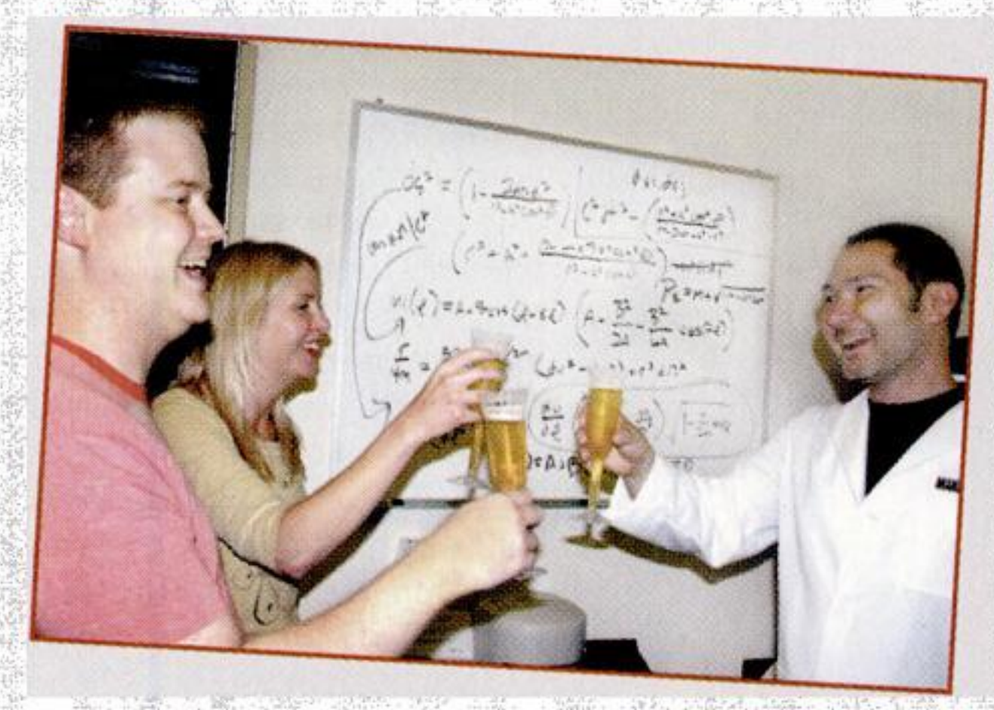
Full-size case:
ThermalTake Armor VA8000BWS

Our current gaming favorites: *Far Cry, Obscure, Psychonauts, Unreal Tournament 2004, Tribes: Vengeance*

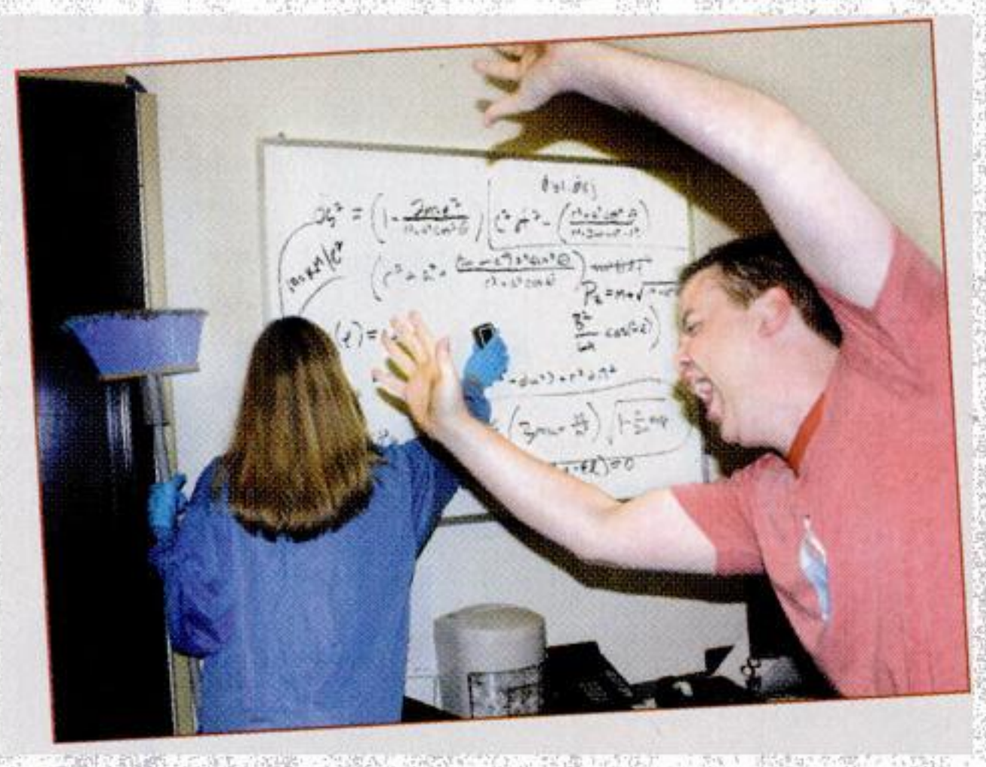
Fun While It Lasted



Working day and night in the Lab, Gordon and Logan attempt the seemingly impossible: a single formula for generating a hilarious, knee-slapping Photo Funny every month.



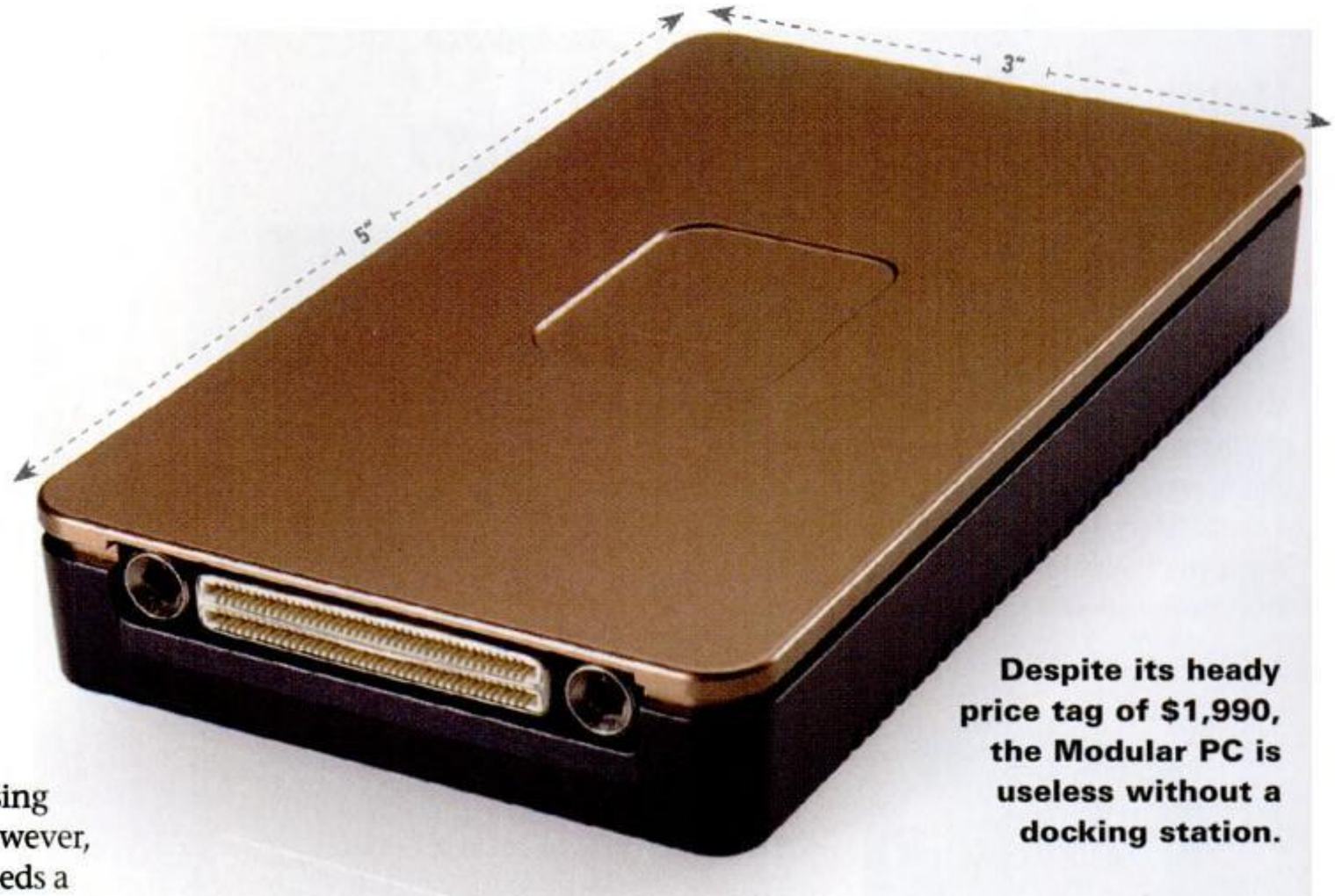
They said it couldn't be done, but *Maximum PC* proved them wrong. The Humor Metric Tensor Matrix is a dazzling success, and the staff rejoices with champagne and Chex Mix.



Even the cleaning lady indulges in a few sips of bubbly before moving on to her daily work. Editor-in-Chief Will Smith is struck with a strange sense of apprehension: Hmm, first she empties the trash, then she erases the... *"Noooooooo!"*

MCC Modular PC

A solution in search of a problem

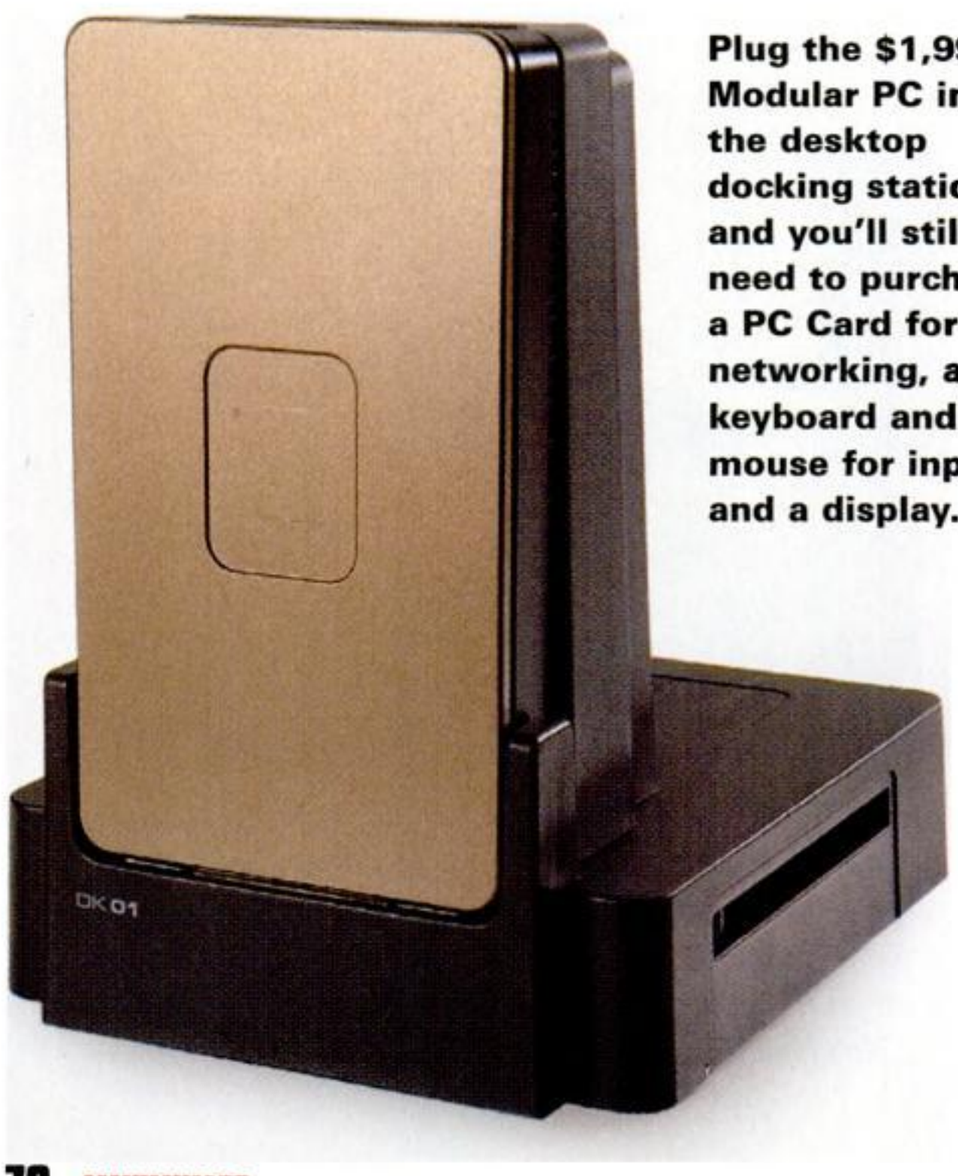


Despite its heady price tag of $1,990, the Modular PC is useless without a docking station.

The engineers at MCC must have been inspired by the *Goldilocks* fairy tale. We can imagine them sitting around a conference table, chanting: "Laptops are too big; PDAs are too small. Let's design a portable computer that's *just* right." After using the Modular PC for a week, however, we've concluded that MCC needs a new recipe for porridge.

The idea behind the Modular PC is solid: Why buy a desktop PC, a notebook PC, a PDA, and a digital photo viewer—and all the accompanying software licenses—when you can buy a small PC that you can take with you almost anywhere. The flaw in MCC's execution is that the Modular PC isn't good enough to replace any one of those devices, let alone *all* of them.

The Modular PC itself consists of a 5x3-inch aluminum brick that's just 3/4 of an inch thick. Sealed inside are a 1GHz Transmeta Crusoe TM5800 microprocessor, 512MB of DDR RAM, a Silicon Motion Cougar 3DR graphics processor with 16MB of video memory, an ALi Audio Accelerator, and a 20GB Toshiba hard drive. Windows XP Professional comes preinstalled. The outside of the unit is devoid of features save an LED (for power status and hard drive activity) and a docking port. The only thing more notable than the fact that MMC was able to cram this much hardware into this small of a package is the price tag: a whopping $1,990.

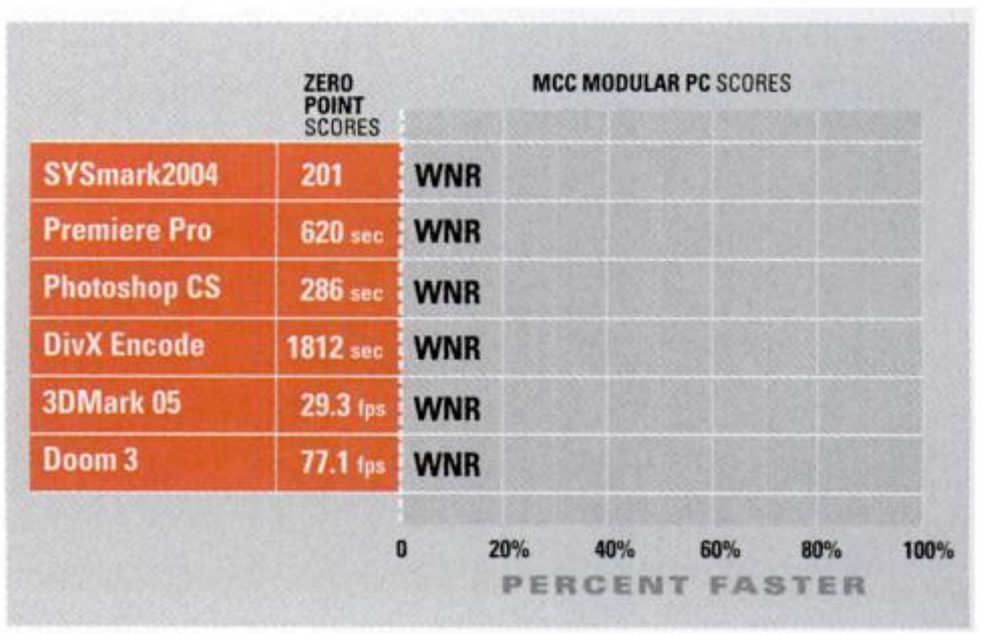


Plug the $1,990 Modular PC into the desktop docking station and you'll still need to purchase a PC Card for networking, a keyboard and mouse for input, and a display.

If you actually want to *use* the computer, you'll need to cough up a few more bucks for modules. The desk module docking station goes for $190. It includes a VGA port, one PC Card Type II slot, PS/2-style mouse and keyboard ports, mic and headphone jacks, three USB 1.1 ports (a single USB 2.0 port is an available option), and an obnoxiously loud fan that never shuts off (unlike the fans on most notebooks, which cycle on and off as temperatures warrant). The desktop module uses an external power adapter, which is sold separately, believe or not, for $135. There's no built-in networking capability either, so you'll need to purchase a PC Card to add the computer to your network or to access the Internet. You'll also need to provide your own mouse, keyboard, display, external optical drive, and any other gear you would expect from a basic PC. Are you hearing the "ka-ching" of the cash register yet?

If you purchased two desktop modules, two power adapters, two displays, two keyboards, two optical drives, and two mice, you could duplicate your work environment in two locations, but you'd only need to purchase licenses for one operating system, and one of each software application you use. If you need to use the Modular PC on the road, you'll need to add the MTM Micro Tablet ($990, or $1,500 for the ruggedized version we reviewed) to your shopping cart. Slide the Modular PC into the Micro Tablet and you have a battery-powered computer you can hold in one hand. Battery life is an unimpressive two hours.

Both Micro Tablet models feature a 6.3-inch LCD touch screen (1024x768 native resolution) that's capable of handwriting recognition (the software for this is a $90



Our zero-point system includes: a 2.2GHz Athlon 64 FX-51, an Asus SK8N motherboard, 1GB of Corsair Registered TwinX DDR400 RAM, an ATI Radeon 9800 XT, a 250GB Western Digital WD2500JB hard drive, Plextor PX-708A DVD burner and a PC Power and Cooling TurboCool 510 Deluxe power supply.

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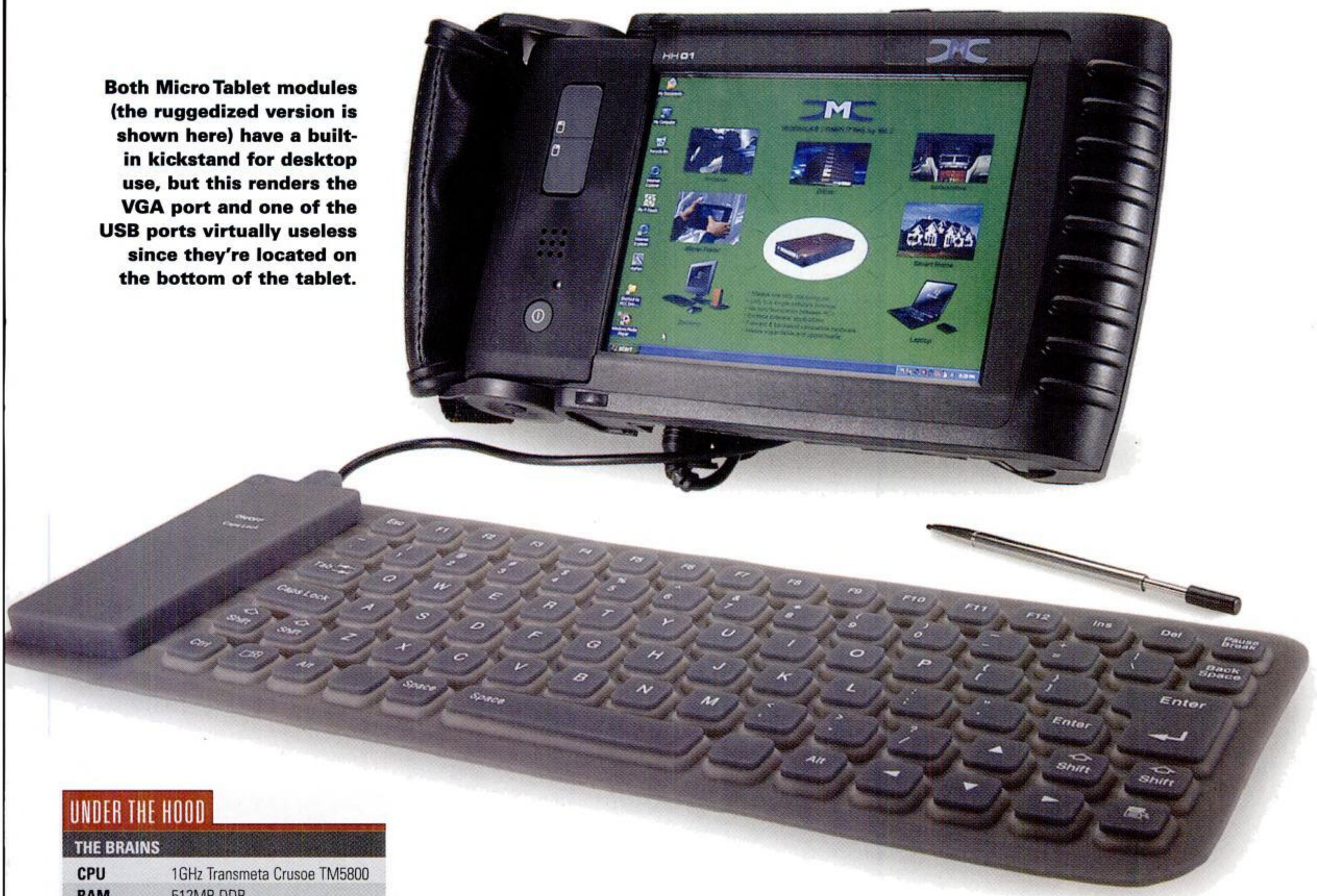


Both Micro Tablet modules (the ruggedized version is shown here) have a built-in kickstand for desktop use, but this renders the VGA port and one of the USB ports virtually useless since they're located on the bottom of the tablet.

UNDER THE HOOD

THE BRAINS	
CPU	1GHz Transmeta Crusoe TM5800
RAM	512MB DDR
I/O ports	3 USB 1.1 ports in desktop module, 2 USB 1.1 ports in Micro Tablet module, VGA port, PS/2-style mouse and keyboard, microphone in, headphone out, PC Card Type II slot
DISPLAY	
Videocard	Silicon Motion Cougar 3DR (16MB video memory, 128-bit bus)
Screen	6.3-inch touch screen LCD (1024x768 native resolution) in Micro Tablet module
STORAGE	
Hard drives	2.5-inch, 20GB Toshiba
AUDIO	
Soundcard	ALi Audio Accelerator with AC97 support
FINE DETAILS	
Case	Micro Tablet wrapped in molded rubber; ports protected by weatherized seals
Extras	Stylus for touch screen, wireless G and 10/100MB/s PC Cards, roll-up keyboard, travel mouse, nylon carry case for Micro Tablet
BUNDLE	
Windows XP Pro	
BOOT: 63 sec.	**DOWN: 39 sec.**

option); plus, all the same I/O ports as the docking station. The ruggedized version is encased in shock-absorbing rubber that protects everything but the most fragile element of the entire package: the display. Besides being vulnerable to scratches and more severe damage, the screen on our test unit was soon covered with smudges and fingerprints.

The Modular PC delivered adequate performance for word processing, spreadsheets, and web browsing, but the machine was sluggish when it came to more demanding applications, such as photo editing. In fact, we couldn't induce *Photoshop* to install itself, so we had to resort to using a copy of Corel's *Paint Shop Photo Album* that was lying around the office. To make matters worse, the Micro Tablet's touch screen exhibited extensive moiré, rendering it unsuitable for viewing or editing digital photos in the field.

Generally speaking, we care less about what a product costs than how it performs. But the Modular PC's price/performance ratio is way out of whack. The cost of the entire system we reviewed—a Modular PC, ruggedized Micro Tablet, power supply, roll-up keyboard, travel mouse, wireless G and Ethernet PC Cards, and travel case will drain your wallet of $4,025. By the end of our product testing, we found ourselves asking the same question we had at the beginning: Why buy a Modular PC when you can pick up a significantly more powerful and versatile notebook PC for less than half the money?

—MICHAEL BROWN

MAXIMUM PC VERDICT 5

+ OOMPA LOOMPAS

Smaller than a notebook; bigger than a PDA.

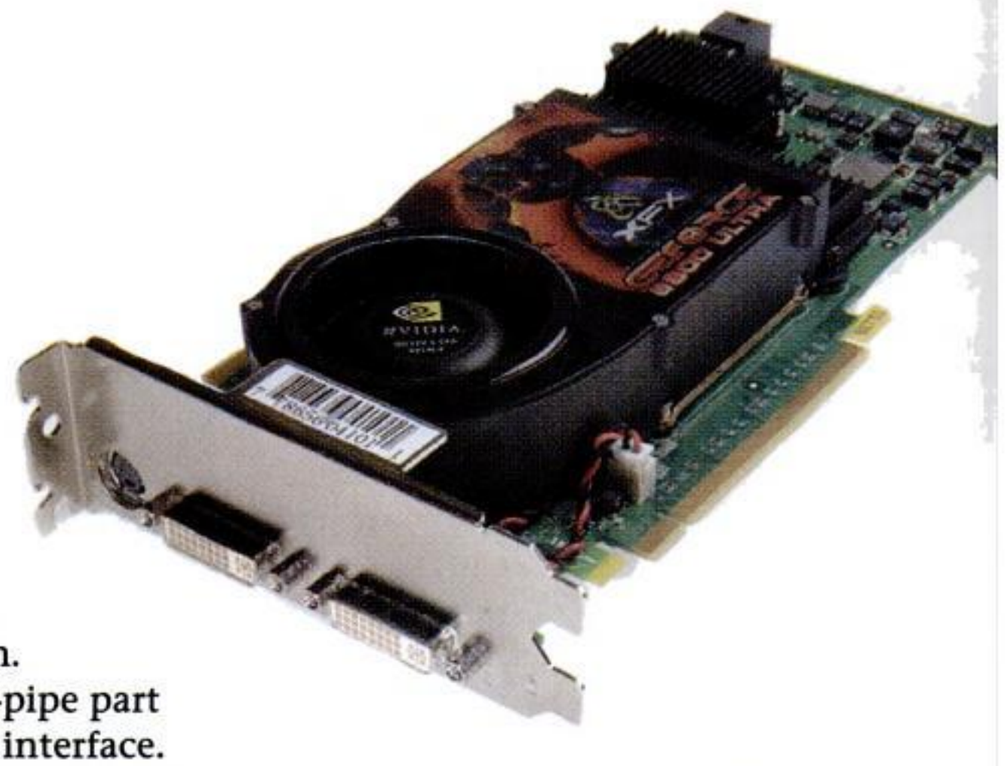
– MUNCHKINS

Slow and underpowered for a machine this stupid expensive.

$4,025, www.modular-pc.com

A Case of the Bloated Buffers

These 512MB videocards fail to impress



Can you say overkill? XFX's GeForce 6800 Ultra with 512MB of graphics memory entitles you to bragging rights, but it doesn't deliver much of a performance boost.

More is always better, right? If 256MB of graphics memory is fabulous, 512MB must be sublime. Well, when it comes to the waning days of the current generation of videocards, our testing shows a bigger frame buffer is overkill.

Nearly all the games available today expect 256MB of RAM at most, so there's little performance benefit to be had from doubling the memory. Our benchmark results back this up. Both of the 512MB cards reviewed here performed on par with their respective 256MB counterparts.

It should be noted that we're not comparing these boards head-to-head—it wouldn't be a fair fight. The XFX board is based on nVidia's top-shelf part, while Sapphire's XL is based on ATI's midrange component. The cards are priced accordingly.

—MICHAEL BROWN

Sapphire Hybrid X800 XL

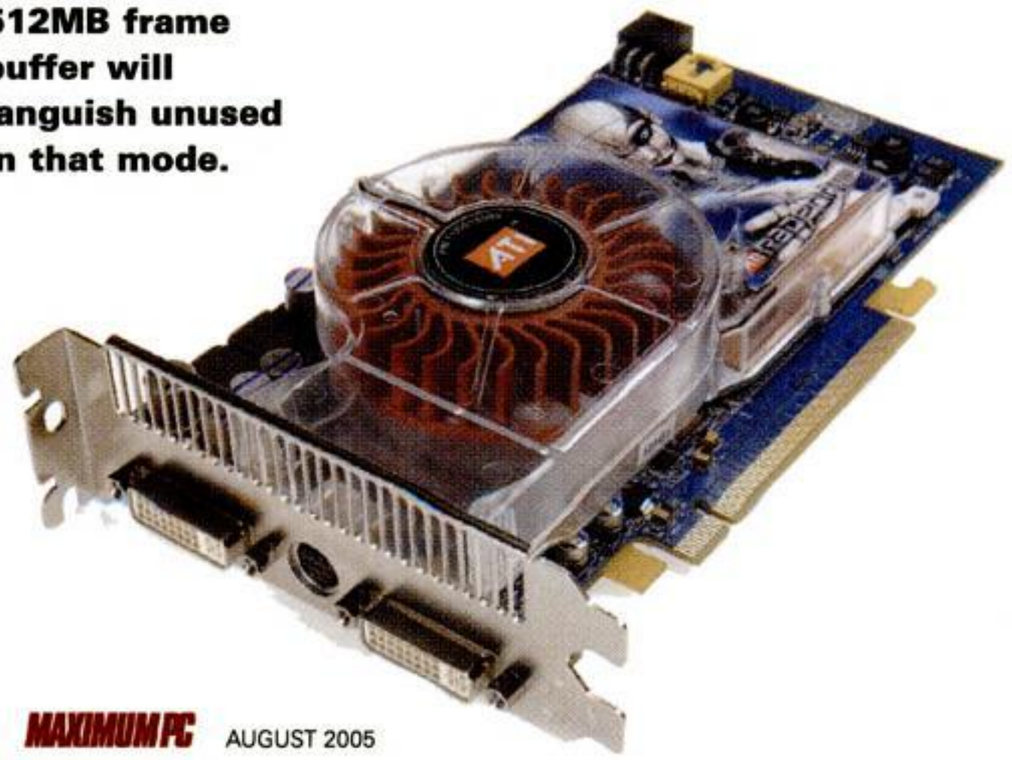
It's noteworthy that ATI created a 512MB reference design for its Radeon X800 XL GPU but left the market to partners such as Sapphire. It suggests that ATI thinks the market for these boards is pretty small. We agree.

The first thing you notice about the Hybrid X800 XL is that Sapphire slapped a huge, two-slot fan on the board. The fan provides effective cooling, which ambitious overclockers will find appealing; however, Sapphire leaves it up to the user to discover the board's outer limits. The board ships with memory clocked at 398MHz and the GPU clocked at 493MHz, just like ATI's reference design.

The X800 XL is a 16-pipe part with a 256-bit memory interface. It would be tough to justify a $450 price tag by simply doubling the graphics memory, so Sapphire equipped the board with dual DVI connections as well as ATI's Rage Theater chip (for analog video in and out).

Given the tiny benchmark performance delta between ATI's X800 XL card with 256MB of memory and Sapphire's X800 XL Hybrid with 512MB of graphics memory, is this board worth the extra $150? We're tempted to say yes, but because ATI and nVidia are on the cusp of shipping an entirely new generation of GPUs, we recommend that all but the most desperate upgraders wave off.

Sapphire's Hybrid X800 XL is compatible with ATI's new CrossFire dual-GPU technology, but half its 512MB frame buffer will languish unused in that mode.



Sapphire Hybrid X800 XL

MAXIMUM PC VERDICT 6

KING KONG

Future games will run better on a larger frame buffer. Dual DVI rocks!

BUBBLES THE CHIMP

The X800 XL is a mere midrange GPU.

$450, www.sapphiretech.com

XFX GeForce 6800 Ultra 512MB

We could overlook the shocking $800 price tag on XFX's 512MB GeForce 6800 Ultra board if it delivered performance to match; unfortunately, buyers will get more of an adrenaline rush from writing the check than they will from playing current-generation games on this beast. As previously mentioned, games just don't take advantage of these large frame buffers.

The fault certainly doesn't lie with the hardware: The 6800 Ultra boasts 16 pixel pipelines and a 256-bit memory interface. XFX has even clocked the graphics core at 430MHz (memory is clocked at 525MHz). There are two DVI ports, as well as a VIVO (video in/video out) port for video-editing projects. Of course, 256MB 6800 Ultra boards also sport these features, which makes the $300 price increase more than a little hard to swallow.

Well-heeled gamers can connect two of these boards together for SLI fun. Keep in mind, however, that with nVidia about to announce its next-gen GPUs, the Ultra's days as king of the GPU hill are numbered.

XFX GeForce 6800 Ultra

MAXIMUM PC VERDICT 5

GODZILLA

The only videocard faster than this is two of these boards in SLI mode.

LITTLEFOOT

It's silly to spend this much money on the eve of a new generation of GPUs.

$800, www.xfxforce.com

BENCHMARK	Sapphire Hybrid X800 XL 512MB	Radeon X800 XL 256MB	XFX GeForce 6800 Ultra 512MB	GeForce 6800 Ultra 256MB
3DMark05	4,804	4,948	5,767	5,536
3DMark03	10,624	10,920	13,316	12,949
3DMark03 Game 2 (fps)	21.6	22.1	27.5	26.6
3DMark03 Game 4 (fps)	31.7	32.1	34.5	33.6
Halo 1.06 (fps)	53.6	54.9	72.0	71.1
Doom 3 Demo 1 (fps)	30.1	31.0	44.6	43.5
Far Cry 1.31 9 (fps)	60.9	60.0	66.3	62.0

All benchmarks are run on our Athlon FX-55 test system, which includes an nForce4 SLI motherboard and 2GB of DDR SDRAM. Halo 1.06 tested at 1600x1200 with sound disabled. Doom 3 tested at High Quality 1600x1200, 4x AA. Far Cry 1.31 and 3DMark 2003 Game2 and Game4 are tested at 1600x1200, 4x AA, and 8x aniso. 3DMark 2003 and 3DMark 2005 are run using default settings.

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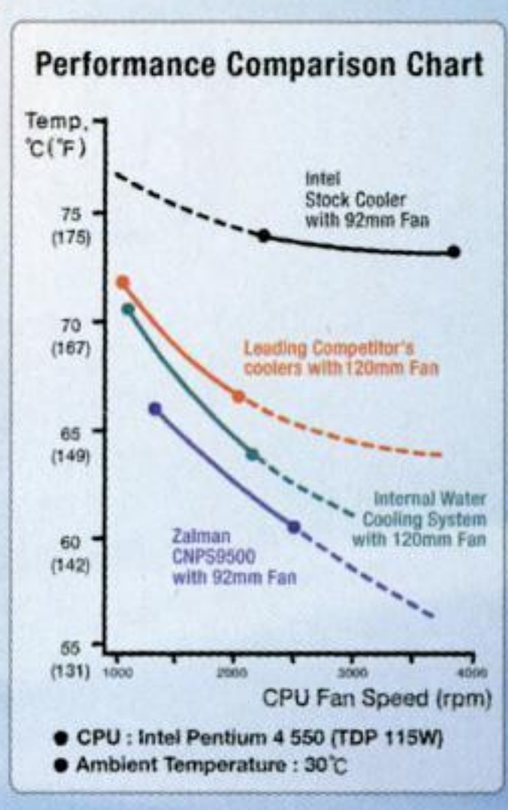
Endless Innovations

ZALMAN

The Art of Cooling Redefined

CNPS 9500 LED

Ultra Quiet CPU Cooler



● Ultimate Perfomance

100% copper heatsink with aerodynamically optimized "tunnel" design for maximum cooling efficiency

Innovative patented heatpipe bending design for a heat transfer capability equal to 6 heatpipes with just 3 heatpipes

● Ultra Quiet Operation

Ultra Quiet CNPS 92mm opaque fan with blue LEDs

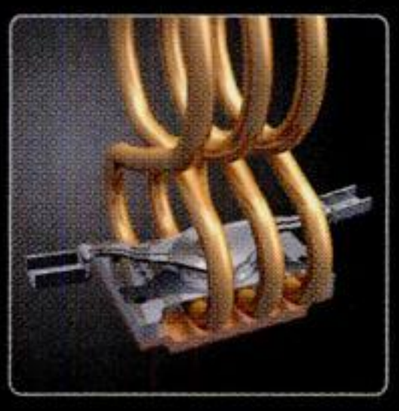
Aerodynamically optimized heat sink for smooth airflow and minimal noise

● Minimized Weight

Optimized heatsink layout for maximum cooling efficiency with minimal materials

0.2mm ultra slim fins for miniminzed weight and reduced airflow resistance

● Broad Compatibility



Intel Pentium 4 (Socket 775/478)

AMD Sempron/AMD64 (Socket 754/939/940)

Specifications

Dimensions (L X W X H)	85 X 112 X 125 mm (3.35 X 4.41 X 4.92 inch)
Heatsink Material	Pure Copper Base Pure Copper Fins Pure Copper Heatpipes
Weight	498g (17.56oz)
Dissipation Area	3,498 cm^2 (542.19 $inch^2$)
Fan Size	92 X 25 mm (3.62 X 0.98 inch)
Fan Operating Voltage	5~12V
Rated Current	0.35A
Max. Power Consumption	4.2W
Bearing Type	2-Ball Bearing
Fan Speed	1,350 - 2,600rpm ±10%
Noise Level	18.0 - 27.5dB ±10%
Connector	3-Pin
Fan Speed Controller	FAN MATE 2

COMPUTER NOISE PREVENTION SYSTEM

[Zalman Tech Co., Ltd.] #1007 Daeryung Techno Town, 448 Gasan-dong, Gumchun-gu Seoul, Korea / Tel : +82-2-2107-3232, Fax : +82-2-2107-3322 / E-mail : zalman@zalman.co.kr / Homepage : http://www.zalman.co.kr
[Zalman USA, Inc.] 10531 Garden Grove Blvd., Garden Grove, CA 92843, U.S.A. / Tel : 1-714-530-0700, Fax : 1-714-530-0707 / E-mail : zalman@zalmanusa.com / Homepage : http://www.zalmanusa.com

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Koolance Exos 2 Water-Cooling Kit

Cool in every sense of the word

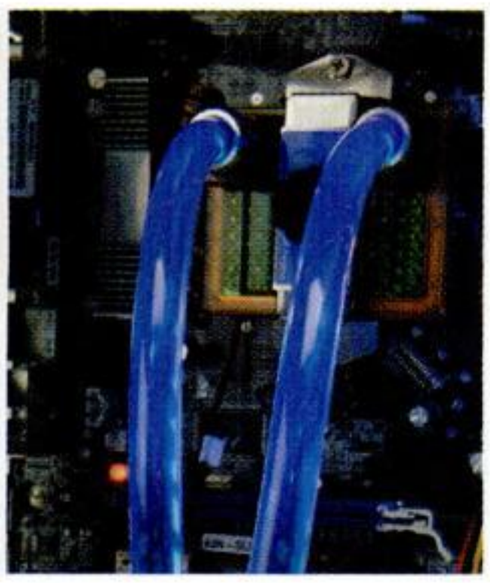
The Exos 2 includes a fail-safe measure that can shut down your PC automatically in the event of a pump failure. How cool is that?

The Koolance Exos 2 is an external water-cooling kit made for people with some serious cash on hand and a distinct aversion to the typical hassles of configuring a water-cooling circuit. Yes, it's pricey, but so, so worth it, thanks to its easy installation, outstanding performance, and snazzy features.

MAXIMUM PC KICK ASS PRODUCT

Because it's an external unit, there's no need to figure out where to put the pump, reservoir, and radiator, it's all crammed into a sleek aluminum enclosure that sits on top of your PC. Two 3/8-inch tubes hang off the back of the unit, snaking down into your PC via a pass-through plate that screws into an empty PCI slot. The input/output tubes connect to water blocks for a CPU, chipset, videocard, and even a hard drive. The kit's $350 retail price includes just the external unit, however, so you have to purchase whatever water blocks you need separately.

The unit itself contains a blue LED-lit reservoir and dual redundant water pumps that work in tandem, with one pushing the water out and the other sucking it in. The dual pumps are also a safety feature; in case one fails, the other one operates long enough to allow a system shut-down. On top of the unit are two 120mm fans blowing down on an aluminum radiator of the same size. Fan speed is controlled with the easy-to-use LCD control panel located on the front of the unit.



The kit uses 3/8-inch tubing to connect to the CPU block. The tubing is UV reactive; the blue color is from anti-algae and anti-corrosion additives.

The kit includes three temperature probes, one of which is used for the CPU water block, while the other two can be placed wherever you like. Once taped in place, you can set the fans to "auto" mode, and they will increase or decrease their speed according to the temps reported by the probe on the CPU block. You can also customize temperature alarms for each probe, so when the specified temperature is reached, all fans zoom to full-speed or the system shuts down completely. It all works perfectly too; the only problem is that the CPU probe is taped to the side of the water block, below where the block contacts the CPU heat spreader, so it's wildly inaccurate. Alternatively, you can control the fan speed manually by pressing the up or down arrows on the LCD display. All in all, the fan control setup is slick and easy to use.

Installation is also a snap. Unlike every other water-cooling kit we've ever tested, the Exos 2 comes with—be still our beating hearts—a color manual. All current CPUs are supported, although Athlon 64 and LGA775 procs require special adapters (sold separately). The all-copper water block sits on top of the CPU and a screw-down retention plate holds it in place. During testing, the reported temperatures were superb, and with the fans set to run at speeds 1 through 5 the system was totally silent. From 6 to 8 the fan noise is more obvious, and it gets a bit loud when set to 10, which is never necessary.

Its overclocking performance was also stellar. The Exos 2 let us ratchet up our P4 3.6GHz to 4.25GHz, which is the same staggering clock speed we reached on this test bed with last month's Asetek WaterChill kit. On our Athlon FX-55 system, however, the *Asus A.I.* overclocking utility gave us all kind of problems, both with the stock cooler and the Exos unit. Its instability and wonkiness prompted us to scrap all plans for FX overclocking, unfortunately.

Overclocking snafus aside, the Exos 2 is the best kit we've tested recently. It's a shame it's so expensive, but the cost isn't surprising given the product's performance, features, and overall ass-kickingness.

—JOSH NOREM

BENCHMARKS

	Exos 2	Stock heat-sink/fan
AMD FX-55		
IDLE		
Fan Low	36 C	
Fan Medium	32 C	
Fan High	30 C	34 C
100% LOAD		
Fan Low	52 C	
Fan Medium	43 C	
Fan High	41 C	49 C
Intel LGA775 3.6GHz		
IDLE		
Fan Low	36 C	
Fan Medium	35 C	
Fan High	33 C	44 C
100% LOAD		
Fan Low	57 C	
Fan Medium	46 C	
Fan High	43 C	63 C
Overclocked to:	4.25GHz	4.0GHz

MAXIMUM PC VERDICT 9

+ WATER COOLED

Easy install, excellent cooling, and advanced features.

– AIR COOLED

Pricey, and CPU temp probe reports misleading numbers.

$410 ($350 kit, $60 CPU block), www.koolance.com

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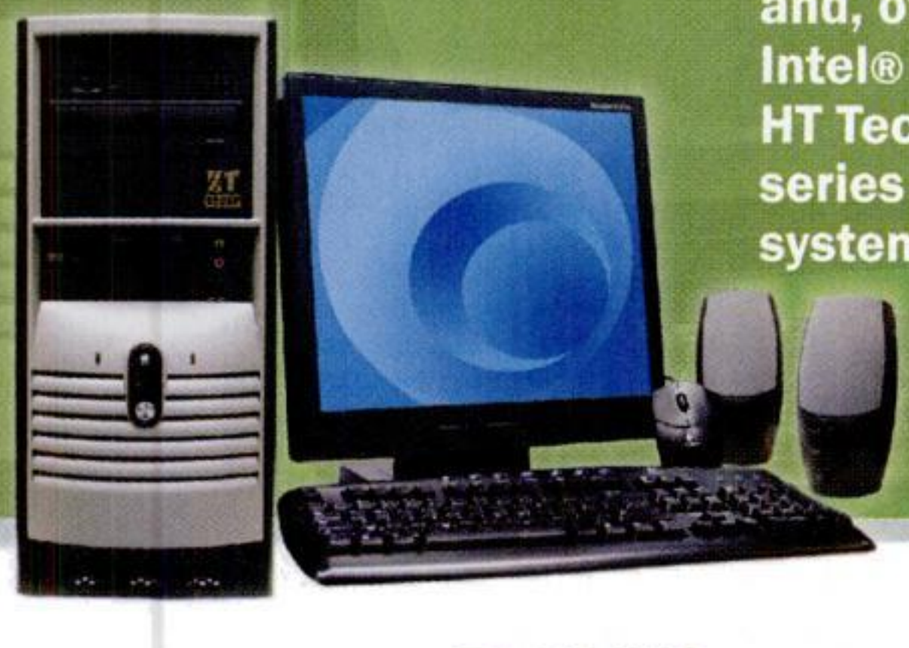

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PalmOne LifeDrive

Who said the PDA is dead?

Well, whoever did obviously doesn't travel much. Laptops are bulky, expensive, and overkill for many on-the-go tasks. Paired with a fold-up external keyboard, a PDA is more than enough for the peripatetic geek on a short hop from San Francisco to Los Angeles. Still, some folks chafe at the limited storage capacity of traditional PDAs, so we're feeling bold enough to say that if the LifeDrive—with its integrated 4GB hard drive—is what you've been looking for, you'll know it right away.

PalmOne cannily tuned the LifeDrive to appeal to weary pilgrims who are sick of carrying a laptop, MP3 player, and USB key everywhere they go. We've heard that from PalmOne before, but this time the company means it. In addition to the bodacious hard drive, the LifeDrive at last supports both Bluetooth and Wi-Fi. It's bulkier and heavier than most PDAs—it's almost an inch thick and weighs 6.8 ounces—nonetheless, the LifeDrive still looks the part with a fine silver finish and generously spaced programmable buttons. The headphone jack is placed at the bottom of the device, which seems odd until you watch a video—you'll never have to bat the headphone cord away. Video plays in both landscape and portrait mode, and there's a handy button on the side for switching orientations. The 320x640 display is a welcome upgrade from previous PalmOne PDAs, but it still pales in comparison to Pocket PCs with full VGA screens; typical of all PDAs, the viewing angle is extremely limited.

SPECS	
Proc	Intel 416MHz XScale
Memory	16MB ROM, 4GB HD
Display	320x480 TFT touch screen, 65K colors
OS	Palm 5.4
Wireless	Bluetooth 1.1, 802.11b
Expansion	SD card slot
Battery	Li-Ion
Weight	6.8 ounces

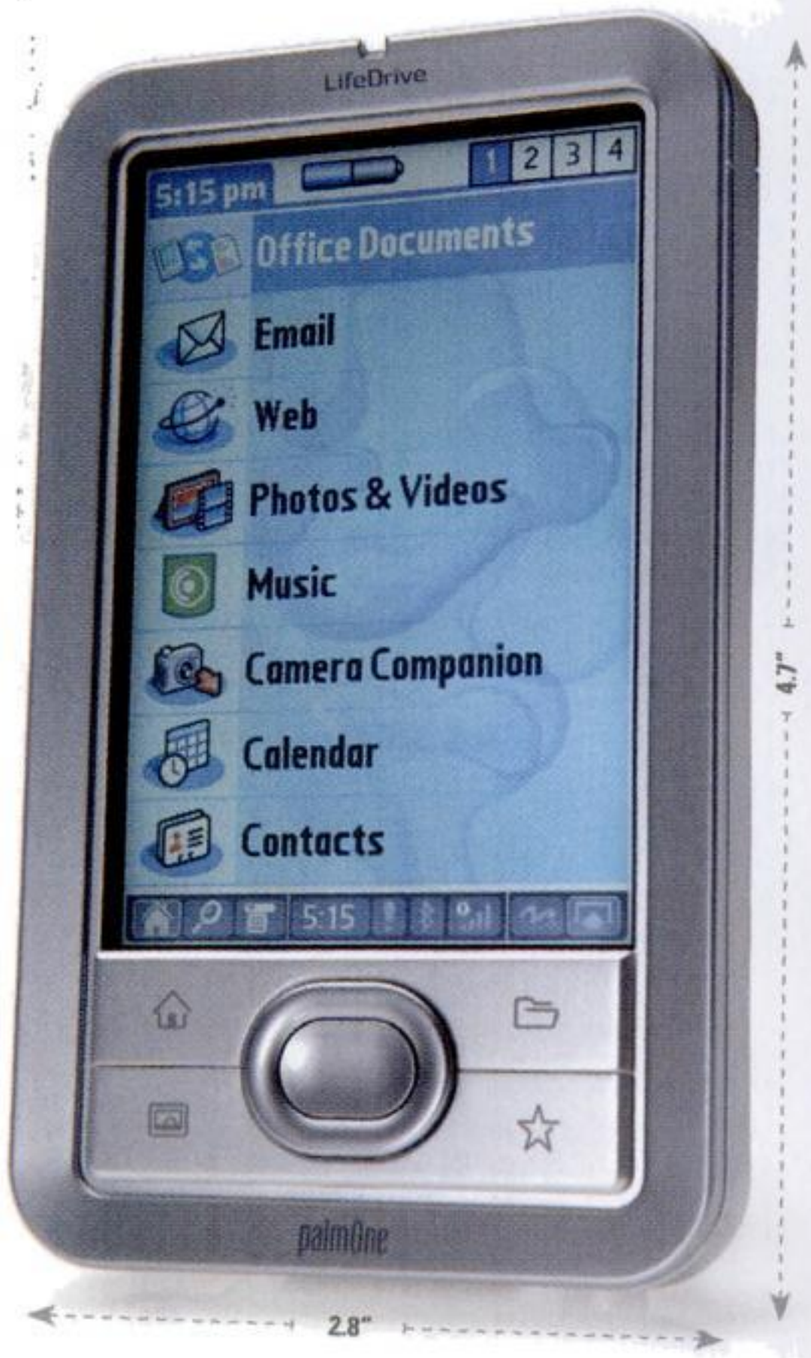
The Home screen provides shortcuts to every conceivable PDA task, from document editing to video playback. It also gives you access to the Drive Mode, which allows the LifeDrive to act as a removable storage device that's accessible by any PC or Mac. And as we've come to expect from the Palm OS, basics such as e-mail and file synchronization are handled deftly and with a minimum of fuss (the LifeDrive even includes idiot-proof VPN support).

Despite the snappy Intel 416MHz Intel XScale processor, the LifeDrive's performance is unimpressive. Horrible lag plagues every aspect of the device. You'll have to wait several seconds after pressing a button to see any results. This isn't a major drawback if you don't switch tasks often, but we do—and we were extremely annoyed. Browsing the web from a Wi-Fi connection was painfully slow for us, as well, far behind the load time of any other PDA we've used this year. And don't even *think* about doing more than one task at a time on the LifeDrive. Not only does launching an application while listening to an MP3 make playback stutter, but so much as pressing a LifeDrive button—to go to the Home screen—results in a punishing crackle in your headphones. The LifeDrive can play some MPEG-4 videos, but it's very picky about how files are encoded; most of the time, you'll need to allow *Palm Desktop* to transcode your video for viewing on the device.

The LifeDrive runs PalmOS 5.4, which is showing its age and losing its ease-of-use edge over the Windows Mobile platform, especially when we factor in the craptastic button response. As for the battery life... well, you'll want to keep your charger handy. We got 2:10 (hours:minutes) of continuous video playback before it pooped out. In frequent but noncontinuous use throughout the day, our test LifeDrive made it a day and a half before we ran outta juice.

At $500, the LifeDrive isn't an impulse buy. Although the integrated hard drive is a sexy, bold step forward for PDAs, the firmware needs heavy polishing if PalmOne wants to attract the attention of the LifeDrive's potential audience.

—LOGAN DECKER



With a 4GB internal hard drive, PalmOne's LifeDrive may finally liberate you from sled-dog duty for your laptop.

MAXIMUM PC VERDICT 7

PALM TREES

4GB internal hard drive, useful Drive Mode, and effortless e-mail and file sync.

PALM READERS

Creaky OS, extremely sluggish, and cannot effectively multitask.

$500, www.palmone.com

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Seagate 400GB External Hard Drive

Not since the Nebraska land rush has so much space been so inexpensive

The Seagate external drive can be mounted vertically (as shown) or laid flat. The rubber rings on the chassis lock into grooves on the drive's bottom for easy stacking.

When we last visited Seagate's external backup drive (the company's product-naming department must be understaffed these days), it sported a mere 160GB courtesy of the company's seventh-generation 7,200rpm hard drive. Seagate just released a second-gen backup unit, replete with its heavily revised eight-generation drive, the 7200.8. The new drive is a wee bit faster than the one it replaced, but the biggest improvement is its massively increased capacity. At 400GB it's the biggest single-drive backup unit available. The drive sports a ho-hum 8MB buffer.

The drive's chassis offers a single USB 2.0 port and two FireWire ports for daisy-chaining devices. It's a shame there's not an extra USB port as well, but there is a handy button on the front of the plastic housing that launches a predefined backup routine when depressed. Along with the drive upgrade, Seagate has switched the backup software from Dantz *Retrospect* to CMS *BounceBack Express*. This isn't really an upgrade, however, as *BounceBack* is a pared-down program. It backs up your machine without letting you dig into the myriad backup options that were previously available. Of course, some of those options were unnecessary, so this isn't such a bad thing. In fact, *BounceBack* is very capable and extremely easy to use, and for backup software, we prefer simplicity, so the software switch was actually a wise move on Seagate's part. Still, *BounceBack* does have a few quirks: If you set up a backup routine, then switch your drive to use the other interface (USB to FireWire, or vice versa), you have to reinstall the software and set up your backup routine all over again to make it work properly.

Besides the software oddities, our only complaint with this drive is that it's very loud during seek operations. If you want the drive to perform backups while you sleep, make sure it's in another room, otherwise it'll keep you up all night. The good news is that this drive is an exceptional value. At press time, the external drive costs the same as the internal drive, so you're getting the chassis, connectors, and software for free.

—JOSH NOREM

MAXIMUM PC VERDICT 9

+ HUMONGOUS DRIVE

Easy to use, huge capacity, and reasonably priced.

– HUMONGOUS ASS

Quirky software, noisy seeks.

$300, www.seagate.com

Turtle Beach Video Advantage USB

Budget-priced video-editing suite packs a punch

The Video Advantage USB captures analog composite or S-Video along with stereo audio, encoding the signals to digital in real time.

We like the video-capture portion of Turtle Beach's Video Advantage USB package so much that we're knocking off only one point for the mediocre third-party video-editing software bundled with it.

The Video Advantage USB is super easy to use, but it's not so oversimplified that it insults your intelligence. Rather than give you just one choice of video-capture format, Turtle Beach lets you choose between six: raw uncompressed AVI, AVI DV Type 1 (native DV, which consists of compressed video interleaved with PCM audio in a single stream), AVI DV Type 2 (native DV, plus the same PCM audio split into a separate stream), either of the more lossy compressed video formats (MPEG-1 or MPEG-2), and WMV format (a good choice for web streaming).

We captured our test video in AVI DV Type 1 format. The video quality was great, but the files were huge. We experienced no dropped frames or audio/visual sync problems even though we were capturing from 15-year-old VHS tapes.

You'll want to pair this device with a fast CPU—Turtle Beach specifies a 2.0GHz P4 or 1.8GHz Athlon as minimum requirements—because the package leans heavily on the CPU for real-time encoding. Plug one end of the diminutive converter into your PC's USB 2.0 port, plug your camcorder or VCR's audio and video connectors into the other, install the software, and you're ready to go. The device draws power over the USB port, so there's no need for an AC adapter. All the cables you need are included—your video source and PC can be about 12 feet apart if you use the provided cables.

You'll need to launch a separate application—Cyberlink's stripped-down *PowerDirector DE*—to edit your captured video, and yet another program—Cyberlink's *PowerProducer Express*—to burn your movie to DVD. Although *PowerDirector DE* is easy to use, we would gladly trade several of its wonkier transitions for a simple fade-to-black or a good dissolve. Our advice: Buy Video Advantage USB, but dump the Cyberlink programs in favor of *Pinnacle Studio Plus* ($100). Put the two together and you'll have the best video-editing and burning solution for the money.

—MICHAEL BROWN

MAXIMUM PC VERDICT 9

+ PINK FLAMINGOS

Excellent and flexible video-capture solution.

– LAWN FLAMINGOS

Third-party video-editing software leaves much to be desired.

$130, www.turtlebeach.com

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Ovideon Aviah 5GB Portable

Oh, say can you see by the OLED?

"Oh say can you see/By the OLED/The player ain't perfect/ But the features aren't wee."

"Portable video player seeks bright, high-contrast display with super-wide viewing angle, lush color, and fast refresh rate for dating and possible LTR." It was a pathetically optimistic request, but lo and behold, along came organic light-emitting diode (OLED) screens with all those features, and flowers and candy too. Ovideon's Aviah portable video player/recorder sports the first full-color OLED display we've seen in a shipping product. Though OLED isn't exactly a disappointment, we remain skeptical about this particular relationship.

Before we obsess over the novelty of OLED technology for viewing movies and photographs, let's inventory all the features packed into this 5-ounce PDA-size doohickey. You won't be surprised to find the integrated FM tuner—you probably won't even care—but we love the Aviah's built-in TV tuner. It accepts signals via a telescoping antenna or RF cable adaptor (both included). Reception was well above average for a portable TV, and the Aviah even lets you record analog broadcast signals to the player (or signals from analog sources, via the included composite cable) to the Aviah's internal 5GB hard drive in one of three quality settings, without the hassle of "digital rights" restrictions.

The Aviah plays MP3 and WMA tracks, but not AAC, protected WMA, or even WAV files. Compared with dedicated MP3 players, it's downright inconvenient; you can't, for example, fast-forward to the next track with a button press—you have to stop the current track first, then select the next track in your music folder. Some editors thought the sound was a hair flatter than A-list players, but there was no consensus, and surely not enough agreement to merit a spanking. The peak volume will blow your cap off.

On our first date, the Aviah's 521x218, 2.2-inch display was a Technicolor dream. Its colors were brighter and more saturated than anything we've seen on a handheld—even a high-end PDA like Dell's X50v—and unlike traditional LCD screens, still images and video look fantastic even when viewed at an angle. Despite the great color reproduction, the screen's appeal is significantly marred by a coarse dot pitch and obvious horizontal striations on the screen. You lose a great deal of detail in photographs, and moving images look like they're obscured by a thin layer of cheesecloth. But the effect isn't awful, and it's a compromise we're willing to live with for an ultra-portable video player this feature-packed.

OLED technology was supposed to require less power than LCD tech because the pixels are self-illuminating and therefore don't require a backlight. Nonetheless, battery life is the Aviah's worst failing. We got less than two hours of playback from a single battery charge—maybe that's why Aviah includes a spare battery in the package. Also, the Aviah does not recharge via the USB port, so you'll need to keep the AC adapter with you—what a drag.

Although the Aviah will play video up to the standard DVD resolution of 720x480, our tests showed that it can't really handle anything above 640x480 without dropping the frame rate to a webcam-ish 15 frames per second. This isn't a problem if you intend to use the bundled *PMP TransC* software to transcode your video. Using *TransC* at its default settings, you'll get good-quality video that plays back smoothly on the player.

The display isn't all it could be, transcoding remains a drag despite the capable software bundle, and the battery life is atrocious. But if the features stitched into this do-it-all player and recorder appeal to you, remember that a key ingredient to any successful relationship is being able to live with a few flaws.

—LOGAN DECKER

MAXIMUM PC VERDICT 6

+ WUNDERKIND

Vivid color on the display, and chock-a-block with features and accessories.

– WONDER BREAD

Battery life is horrible, display shows striations, and video frames get dropped.

$600, www.ovideon.com

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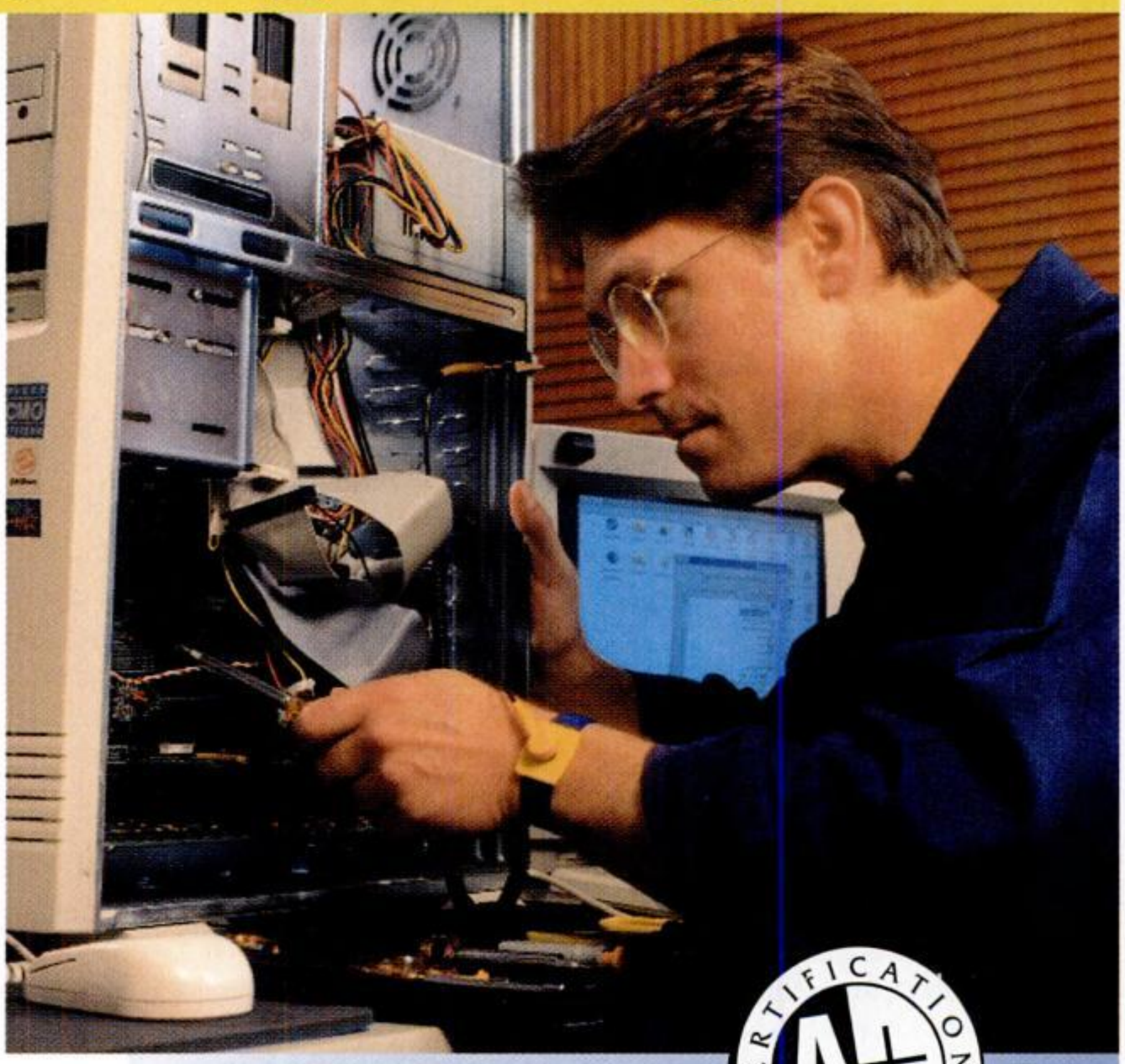

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Kodak EasyShare Z740

The digital version of Polaroid?

It's hard to beat the EasyShare Z740 in the ease-of-use and convenience categories.

The EasyShare moniker is by no means a misnomer. Just five minutes after unpacking this all-in-one digital camera and printer bundle we had a trio of slick-looking 4x6 digital prints in our greedy little mitts—and that's without even glancing at the prodigious manual Kodak tosses in.

The Z740 is a mid-size camera that's made mostly of plastic, so it looks and feels a bit cheap, but the 5-megapixel image sensor delivers solid pictures with natural colors and skin tones. They're not as vibrant or sharp as those you'll get with higher-end cameras, but image quality is comparable to other similarly priced digicams. The optical 10x zoom is impressive, and the camera comes with a plethora of preprogrammed scene modes that cover just about any shooting situation we could think of. If you want to dabble, aperture priority, shutter priority, and other manual control options are provided as well. Unfortunately, the Z740's movie-capture capability is not good—not only is the picture quality sub par, but the frame rate is also poor.

The Series 3 Printer Dock lets you print photos directly from the Z740—without a PC. (You can also use the dock to transfer photos to your PC, view photos on your TV, and charge the Z740's battery.) The printer uses a four-pass thermal dye-transfer process—three passes to apply color and one to apply a protective coating. Printing a photo is as simple as placing the camera on the dock, selecting the photo you want and the number of copies, and punching the Print button. In less than two minutes you'll have a nice, glossy 4x6 print that looks like its straight from the local photo lab. The printer's compact size means you can easily toss it in a suitcase and take it on vacation, too.

While the pics look nice, it's important to remember that the EasyShare system is touted as being not only convenient, but affordable as well. However, a 40-count of ink and paper for the printer will run you $25, which translates to $0.63 a print. The same print will cost you less than $0.20 down at Costco.

Keeping the price tradeoff in mind, the EasyShare Z740 is an excellent choice for budding digital photographers that want fast, good-looking results with as gentle a learning curve as possible.

—STEVE KLETT

MAXIMUM PC VERDICT 8

+ SCOOBY DOO

Lots of features, good picture and print quality, and very easy to use.

– SCRAPPY DOO

High cost per print, cheap construction, and below-average movie capture.

$480, www.kodak.com

Leica Digilux 2

This could be your father's digital camera

Big, bulky, and pricey, the Digilux 2's old-school looks belie its cutting-edge digital capabilities.

If you consider yourself a 35mm photography purist and have been refraining from jumping on the digital bandwagon, then Leica's Digilux 2 might be the excuse that finally gets you to climb aboard.

The Digilux 2 looks and acts like a traditional 35mm Leica M-series camera, sporting the same body design and rugged construction, and even similar lens controls. Other than the 2.5-inch LCD on its back and a minimum of buttons for navigation, this camera looks like it's from the 1980s (or even the '60s or '70s, for that matter). But there's nothing old-fashioned about the 2/3-inch, 5-megapixel image sensor residing in the Digilux 2's chassis. Coupled with Leica's all-glass Vario-Summicron 3.2x zoom lens (28mm-90mm equivalent for 35mm film), the Digilux 2 produces some of the sharpest, most vibrant 5-megapixel images we've seen.

Experienced photographers will simply love the ability to operate this camera completely manually. You can even change settings, such as shutter speed, with the turn of a dial—even while the camera is off. The Digilux 2's manual controls are the easiest to use of any digital camera we've tested. The electronic viewfinder, while a bit grainy, gets the job done. The LCD isn't the sharpest we've seen, but it is easy to view in direct light. And there's a burst mode that will let you shoot three shots at the highest resolution in a tad over a second.

Unfortunately, the Digilux 2 does not have a RAW memory buffer. So if you like to shoot in RAW mode, be prepared to wait as much as 14 seconds between shots, depending on the speed and capacity of your SD memory card. Also, only ISO speeds of 100, 200, and 400 are supported—800 is AWOL, which is a head-slapper at this price point. Oh yeah, did we mention this camera is expensive? It's hard to justify the Digilux 2's rather obscene price when you can get a full-fledged SLR for the same amount, or an equally capable 5-megapixel point-and-shoot for half as much.

The Digilux 2 is definitely not for everybody. But photogs desiring a digital alternative to their trusty 35mm camera, complete with analog-style manual controls, should take a look at the Digilux 2.

—STEVE KLETT

MAXIMUM PC VERDICT 7

+ STAPLE

Excellent lens, intuitive manual controls, and very good picture quality.

– PAPER CLIP

Bulky, overpriced, no RAW buffer, and poor macro performance.

$1,800, www.leica-camera.com

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Sennheiser RS140 Wireless Headphones

Noisy, but convenient

Sennheiser's RS140 wireless headphones sound great, but the background hiss is intolerable.

We dig headphones because we can listen to music and games at max volume without the risk of annoyed co-workers chucking a stapler at our heads. Headphones have one major drawback, however: the audio cable that chains you to the source. Sennheiser's RS140 wireless headphones do away with the tether, but at the expense of crystal-clear sound.

Sennheiser's decision to relay audio using a radio signal (in the narrow range of 926-to-928MHz), instead of line-of-sight infrared, means you can walk all over the house without interrupting the music streaming into your ears. But even with nothing playing, these 'phones are noisy. The transmitter features a "noise gate" function that reduces hiss, but it never completely eliminates it.

The hiss was most noticeable when there was no other audio signal present—between audio tracks, for example—but it was also manifest in quiet musical passages and in pauses in game action. Walking around and turning your head while wearing the phones introduced sporadic pops and clicks. Curiously enough, the noise was much more prevalent in a suburban home environment than it was in the office.

Aside from the hiss (which was almost entirely masked by music or game action) and the random pops and clicks (which bled through nearly anything), the RS140s sound excellent. They feature a closed-back design, so very little audio leaked around the generously padded ear muffs, and they were exceedingly comfortable to wear even after long hours of gameplay. Listening to Chuck Prophet's "I Bow Down and Pray to Every Woman I See" (from *No Other Love*), the RS140s exhibited impressive dynamic range, delivering thumping bass and sizzling highs without sacrificing the deliciously fat midrange of the dobro.

The headphones are powered by rechargeable batteries, and the AC-powered transmitter includes a convenient stand that trickle-charges the phones while they're resting on it. Wireless, rechargeable, Sennheiser acoustics.... There's a lot to like about the Sennheiser RS140s, but that background noise will leave audiophiles reluctant to cut the cord.

—MICHAEL BROWN

MAXIMUM PC VERDICT 6

+ SATELLITE RADIO

No wires; charger cradle integrated into the headphone stand.

– AM RADIO

Background hiss, pops, and clicks.

$220, www.sennheiserusa.com

Gateway 6GB MP3 Photo Jukebox

It's no iPod Mini—and that's not such a bad thing

It doesn't look like much—and even the name is laughably generic—but Gateway's MP3 Photo Jukebox makes the most of its charming minimalism.

Gateway's first MP3 player, the flash memory–based DMP-300 (reviewed in April 2001) was quietly introduced while iPod fever swept the nation, and its bland design and lack of distinctive features seemed to guarantee an extremely short life-span.

That player might have appeared lackluster, but it was a decent performer. The sound was excellent, the interface was extremely simple, and there were none of the superfluous features or uptown design flourishes that discount knock-offs of superior products typically sport. Gateway's taken the same approach with its hard drive–based MP3 Photo Jukebox, and its modest simplicity is a welcome respite from other players that poorly mimic the iPod's design and interface.

The MP3 Photo Jukebox plays MP3s, WMA (including DRM-protected tracks), WAV, and—surprisingly—AAC tracks (but not protected tracks downloaded from iTunes). The 6GB internal hard drive, which can also be used to store data files, provides more than enough space for a player this size. We weren't impressed with the player's 1.6-inch 128x128 full-color display—it's fine for navigation, but the coarse dot-pitch sucks for photo viewing.

Bare-bones is not an understatement. There's no FM tuner, no voice recorder, no AV-out to your television, and no rotisserie for cooking low-fat chicken breasts while sealing in the flavor. And that's the beauty of it. The MP3 Photo Jukebox does what an MP3 player should—it delivers great sound (although the volume ceiling is lower than we would have liked) while making playlist selection and management efficient and nearly effortless.

Two elements in particular are emblematic of Gateway's design approach. First, the company wisely avoided imitating the iPod's touch-sensitive scroll wheel in favor of a simple four-way rocker switch surrounded by playback control buttons. And although the MP3 Photo Jukebox is bundled with *Windows Media Player 10* for syncing and PC-based playlist creation, *you don't have to use it.* You can avoid the mysteries of *WMP 10's* interface by simply dragging music and images into the appropriate folders on the player's drive in Windows Explorer.

Despite the piss-poor display and a proprietary USB connector, the MP3 Photo Jukebox is a welcome alternative to the preciousness of the iPod Mini, and a reminder to its feature-crazed competitors that in consumer electronics, less really can be more.

—LOGAN DECKER

MAXIMUM PC VERDICT 8

+ FRONT ROW

Plays AAC tracks; is charmingly simple and easy to use.

– DEATH ROW

Color screen is pathetic for photo viewing.

$250, www.gateway.com

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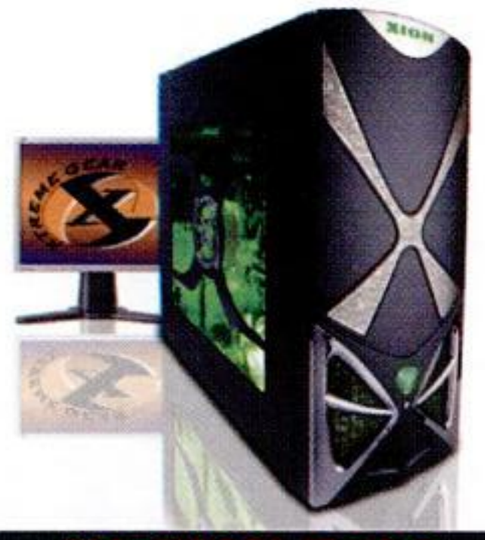

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Han-Key Pan-Key

It's go time for USB thumb drives

Just when we thought we'd seen all there is to see from USB thumb drives, along come these two little fellas. The M-Flyer is remarkable because of its sleek design and switchblade-style cap, and the CryptoStick has every security feature we've been adding to our own USB keys—built in. Which key reigns supreme? Read on!

—JOSH NOREM

M-Flyer TravelDrive

Memorex' M-Flyer is a slick, full-featured USB key complete with a tiny splash of special sauce. It's available in sizes ranging from 512MB to 2GB, and includes a pocket lanyard, a belt-clip, a USB extension cable, and a software CD.

The special sauce is the M-Flyer's loss-less cap. It's impossible to lose the cap, because there isn't one! Instead, you push the bottom of the key to pop out the USB connector. When you're done with your data, press a small button on the key's dorsal ridge, and *snap*, the USB plug retracts instantly. Unlike other keys with retractable USB plugs, we never had a problem with premature retraction.

The security software that's included is very useful, but can be baffling at times. It runs from the key and lets you set aside a password-protected partition that's only visible once you log into the software on the key. Once you log out, the non-hidden "public" partition becomes accessible. Seems pretty straightforward, but once we set the size of the public and private partitions, the "configure size" option disappeared and never came back. Memorex eventually provided a fix, which you can download from its website.

The M-Flyer also comes with an encryption utility that runs directly from the key and lets you encrypt, decrypt, and unzip files. It supports drag-and-drop and is idiot-proof—just the way we like it.

The only *real* issue we experienced with the M-Flyer was the resizing bug; we even like the potentially gimmicky retractable USB plug.

M-Flyer TravelDrive

MAXIMUM PC VERDICT 9

FLYING

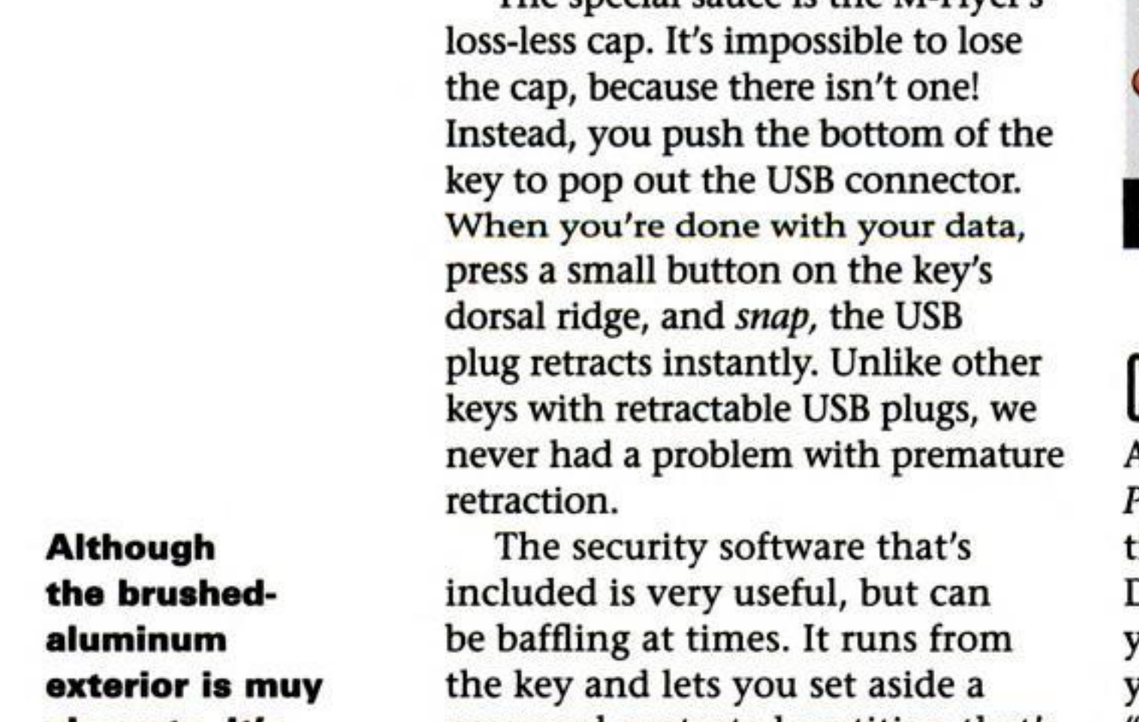
Cool design, good bundle, and excellent goodies.

WALKING

Scratches easily, and software can be confusing.

$220 (2GB), www.memorex.com

Although the brushed-aluminum exterior is muy elegante, it's easily scratched by coins, keys, and other rigors of pocket life.



The CryptoStick lets you send encrypted attachments via e-mail, and your friends can decrypt them with a free utility from the company's website.

CryptoStick USB 2.0

Astute readers will recall *Maximum PC's* June issue how-to project titled "Protect Your Data from Digital Thieves." In it, we showed you how to encrypt the files on your USB key so your G7-clearance "eyes only" nuclear-reactor blueprints remain safe from the Crimson Jihad. Conveniently, the CryptoStick comes bundled with encryption software, which is its primary selling point. The flash memory key is available in sizes ranging from 16MB to 2GB and comes with a USB extension cable.

The primary function of the encryption software, called *CryptoBuddy*, is to encrypt and decrypt files. *CryptoBuddy's* interface is archaic; it presents you with two explorer trees that you use to browse to the files you want to encrypt or decrypt. You can't encrypt using drag-and-drop, so if the files are on your Desktop you have to browse to the Desktop directory on your hard drive. Thankfully, the encryption process is quick and painless, and files are compressed while they are being encrypted (already-compressed files such as MP3s and JPEGs obviously won't benefit from this feature). The *CryptoBuddy* software uses the industry-standard Blowfish algorithm to work its encryption magic.

The CryptoStick also includes a "secure browsing" applet that launches *Internet Explorer 6* (we would prefer *Firefox*), then stores all files relating to your web surfing—including browser cache, history, cookies, favorites, etc.—on the USB key. When you pull the key out of the PC and walk away, you'll leave no trace of your presence on the machine. This feature could certainly come in handy when web browsing at an Internet cafe or when surfing naughty sites on your folks' PC.

Indeed, the CryptoStick has almost everything we want in a USB key. The only problem is its high price. The 2GB version costs $350, a full $100 more than the 2GB M-Flyer key. Our advice: Get the M-Flyer and just download *Portable Firefox* for on-the-go web browsing from your USB key.

CryptoStick USB 2.0

MAXIMUM PC VERDICT 7

ENCRYPT

Tough security, small size, and great software.

IN-CRYPT

IE-only browser, way pricey, and convoluted encryption process.

$43 (128MB), www.cryptobuddy.com

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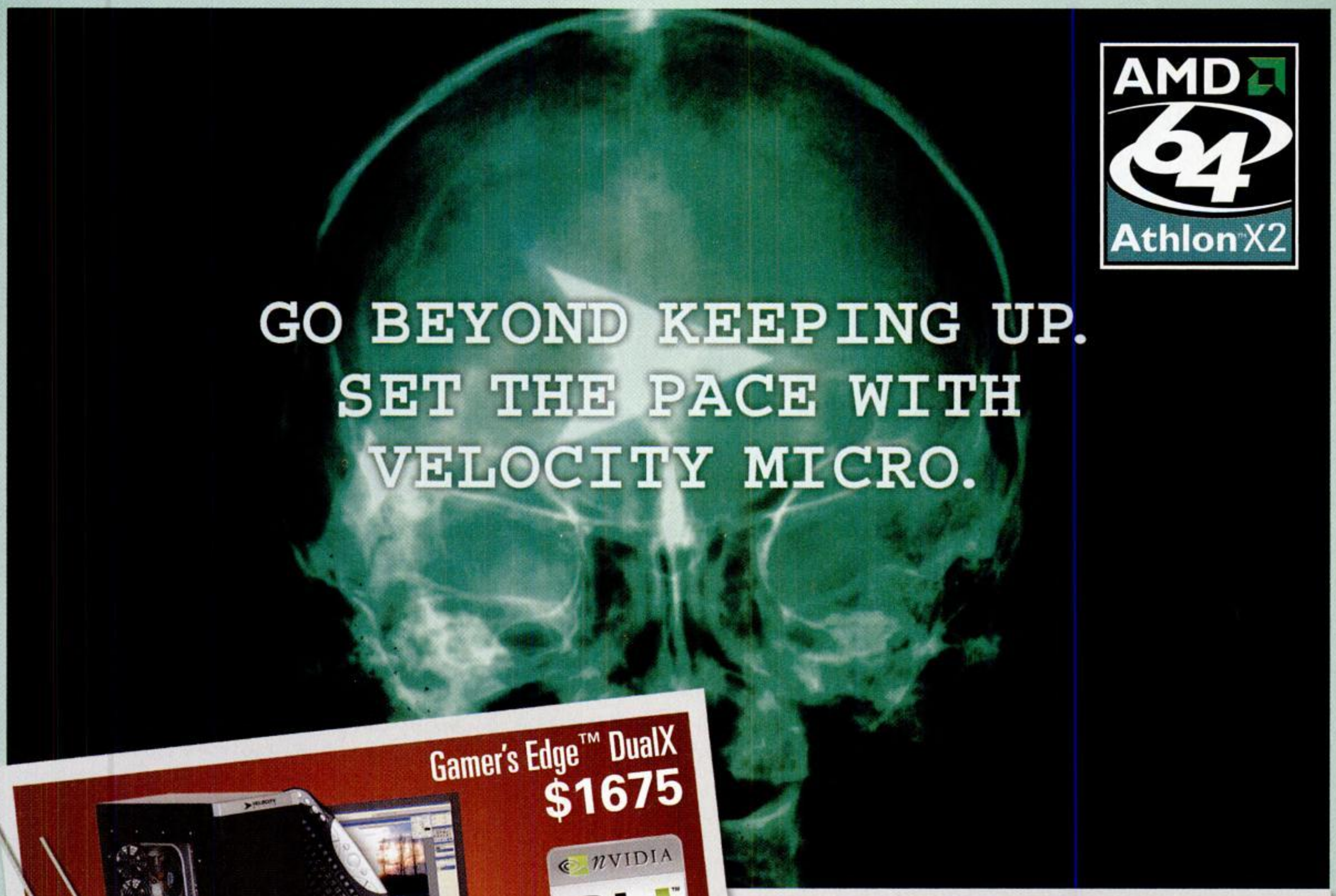
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Easy Media Creator 7.5

A few small steps can make a big difference

Even commercial meat processing can be a dazzling experience for viewers once you get the hang of *Easy Media Creator's VideoWave*.

Nero and Roxio have been locked in a competitive square-dance for years, and we've given both companies' capable disc-mastering suites our Kick-Ass award in the past. But the upgraded modules within *Easy Media Creator 7.5* tilt the suite in a direction that may make choosing between the two easier than it has been previously.

In most applications, *Nero Ultra Edition* and *Easy Media Creator* remain equals. Although we prefer *Easy Media Creator's* extremely calm, plain-English interface to Nero's SmartStart front-end, that's an issue of personal taste rather than technological advantage. Common disc-authoring tasks such as data and audio CD creation could hardly be improved upon from previous iterations, so Roxio keeps competitive with power-user features like support for bit-setting (which lets you "tag" burned DVDs as DVD-ROMs for higher compatibility with PCs and set-top players) and integrated support for HP's fab LightScribe disc-labeling technology, which requires a LightScribe-capable optical drive.

Easy Media Creator 7.5 offers a very useful Divx-to-DVD module, which converts MPEG-4 compressed video to the DVD-Video format and burns the files to a DVD that will play automatically when placed in a PC or set-top player. This isn't a unique feature in a disc-mastering suite, but it is unique in that it didn't choke on any of the Divx or Xvid files we threw at it.

Another welcome addition to the suite is the *Backup MyPC* utility, which extends beyond the applications bundled with other suites and matches the power of Nero's own backup utility feature-for-feature, including scheduling and incremental backups. Roxio also shored up its audio-editing application. Now it supports multi-track editing and includes wizards for recording and cleaning up audio from records and cassettes.

But *Easy Media Creator* one-ups *Ultra Edition* in video editing. The *VideoWave* module makes short work of chopping and presenting video, placing titles, adjusting letter spacing, and adding transitions. The real power lies in the timeline view, where simpletons can create entire videos with edited clips, background music, and titles. Were it not for *VideoWave's* propensity to lock up during clip edits, we'd be much more enthusiastic.

There is one other annoying drawback to *Easy Media Creator 7.5*. In order to update the suite, which you ought to do whenever updates are available, you *must* register the product. This is irksome; even though sharing your e-mail address with other companies is exclusively opt-in, we're annoyed that we have to provide personal information to receive bug fixes. When we attempted to update our copy of *Easy Media Creator* on one machine, we were turned away because it detected a serial number from a prior installation. Why? To make matters even worse, the auto-updater proceeded to crash. *Thanks,* Roxio!

Because of the ridiculous registration policy and the *VideoWave* instability, we are withholding a Kick Ass award from this otherwise fine package.

Ultra Edition and *Easy Media Creator* are still neck-and-neck in their features and ease of use, but the two suites are moving in subtly different directions; *Ultra Edition* is moving toward making once-exotic features like network media streaming and video compression simple enough for technophobes, while *Easy Media Creator* moves toward integrating video editing for the mainstream. We hope Roxio improves *Easy Media Creator's* stability and takes a big step forward in its next revision; nonetheless, it's a power-user's suite in newb's clothing.

—LOGAN DECKER

MAXIMUM PC VERDICT 9

SNOOZES

Wildly comprehensive suite; Divx-to-DVD is a snap; very easy to use.

STOOGES

Mandatory registration, and video editing app is somewhat unstable.

$100, www.roxio.com

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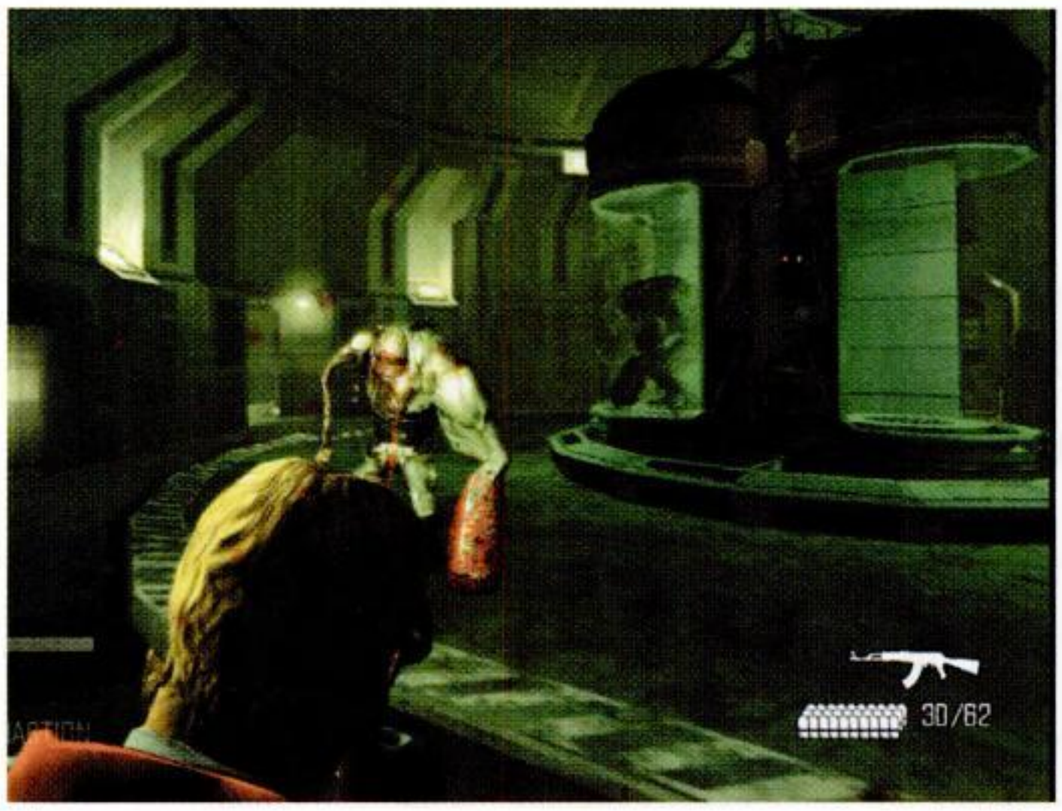
Cold Fear

A console port in a storm



This over-the-shoulder third-person view is just as awkward and hard to use as it looks.

It must suck to be on the Bravo team—you only get sent in when things are looking really, really bad. In this case, "bad" means an enormous Russian whaling vessel adrift in the Bering Sea, where the only signs of life are splattered on the walls and floor of the upper deck.

Playing as action-starved Coast Guardster Tom Hansen, you're drop-lined to the ship in the midst of a torrential storm; a couple monster waves are all it takes to drag you overboard from the constantly listing vessel. This will turn out to be the least of your worries; once you scamper through blinding rain into the ship's interior, you'll find that an infection has mutated the crew into murderous, shambling zombies, and spawned a menagerie of horrors beyond imagining.

Yes, it's *Resident Evil* at sea, complete with the familiar cast (wisecracking hero, fearless female sidekick, remorseful scientist), the interminable loading screens, and plenty of scripted scares. But *Cold Fear's* gritty atmosphere succeeds too well to be judged as a mere *Resident Evil* knock-off. Below decks you'll have to out-shoot and out-maneuver your enemies as you attempt to gain control of the ship's engine room, but above deck, it's a frickin' circus of fear. Heavy rain blurs your vision, and the ship's incessant heaving throws off your aim as you try to draw a bead on multiple foes—in front of you and behind. Even when the action turns to the slightly more stable ground of an offshore oil rig, *Cold Fear* hurls new menaces in your direction, including invisible muties who can be tracked only by their footsteps, and ceiling-crawling parasites that follow the shortest path from your mouth to your brain.

And to top it all off, there's one, final, nearly invincible enemy: the game's control scheme. Bred for the console, targeting is limited to two options—a fast-moving but horribly inaccurate third-person mode, or a sharper over-the-shoulder view that prevents you from turning quickly—both of which will frustrate PC gamers who enjoy the tension of survival-horror but expect the handling of a first-person shooter.

—LOGAN DECKER

MAXIMUM PC VERDICT 7

+ THE LOVE BOAT

A fine-looking, genuinely scary game.

– THE TORTURE BOAT

Handicapped control; been-there-done-that story.

$40, www.coldfeargame.com, ESRB rating: M

Guild Wars

Finally: A high-quality online role-playing game without the monthly fee

MAXIMUM PC KICK ASS PRODUCT

Take that, and that! *Guild Wars* delivers fast-paced MMORPG-esque action that even casual players can get into.

Guild Wars is an MMORPG "lite," offering much of the fun of class leaders *World of Warcraft* and *EverQuest 2*, but without the bank-balance-draining monthly fee and the must-play-all-week requirement to advance. Consider it a gateway to MMO games, and an excellent introduction to the genre.

The game ships cram-packed with quests and missions that can be undertaken alone or with other players. New content is already being added to expand the huge existing game world. Player-vs.-player gameplay is intense, with options ranging from simple arena combat to king of the hill, capture the flag, and of course, guild-vs.-guild battles. And the graphics are downright phenomenal.

Although *Guild Wars* bears many similarities to its MMORPG competitors, there are some key differences. Chief among these is the game's instancing system. Towns and outposts are full of other players, but the moment you leave a public area, you and your group move into a private instance that's just for you. You'll never have to compete with other players for the chance to do a quest or mission. The downside to this exclusionary feature is that *Guild Wars* sometimes feels a bit lonely.

Gamers who have social lives will appreciate that you can play *Guild Wars* casually and still be competitive. Sure, goobers who play 24/7 will have an advantage, but they won't be able to dominate players with less playtime. *Guild Wars* emphasizes earning skills over leveling up, and you can only have eight skills active at any given time.

MMORPG purists may be disappointed that *Guild Wars* is more shallow than pay-to-play online games. There are no secondary professions (such as tailoring or blacksmithing) for characters to try, there's only one playable race, and there's a limited selection of player classes.

Developer ArenaNet plans to release *Guild Wars* expansion packs every eight months or so. The expansions will be optional, and ArenaNet promises that players who don't buy them won't be at a significant disadvantage. We'll see if that holds true, but even without expansions, *Guild Wars* is an excellent online RPG that's easy for casual and hardcore gamers alike to get into.

—OMEED CHANDRA

MAXIMUM PC VERDICT 9

+ NUCLEAR POWER

Rich game world, addictive gameplay, sumptuous graphics, and no subscription fee.

– NUCLEAR WAR

Lacks the depth of some competitors, and the instancing system is a mixed blessing.

$50, www.guildwars.com, ESRB rating: T

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Pariah

Run, gun, rinse, repeat

***Pariah's* second-grade A.I. is on full display here, allowing us to slap this dummy in the face with our bone saw.**

Pariah is a better game than its first 30 minutes indicate. Unfortunately, we found those first 30 minutes so annoying that getting to the rest of the game was a genuine challenge. In the end, the game proved unworthy of our efforts.

Graphically, *Pariah* is borderline luscious, with detailed models, gorgeous landscapes, and plenty of stuff to blow up. The special effects are killer, too: On a second pass through one of the earliest levels in the game, we discovered that chucking a grenade into the foundation of a mammoth concrete tower brought the entire edifice down. That didn't happen the first time we attacked that position. We were less impressed, however, when an enemy soldier sauntered out of the piled rubble unscathed.

In fact, the untouchable soldier proved to be just one of many events that yanked us out of the game world. Of course, the developers provide little reason to stay *in* the game world in the first place. There's no real storyline behind the carnage: You have only the vaguest idea of who you are, who's trying to kill you, and what you're supposed to do. This wouldn't be so bad if you got sucked into the run-and-gun action, but the game's checkpoint-based save system forced us to repeat so many levels that we found ourselves wishing we could turn our exotic weapons on the devs.

Breaking up the monotony is a better-than-average arsenal of weaponry. The bone saw is a fabulous melee weapon, whether you run out of ammo or just can't avoid hand-to-hand combat. All six of the projectile weapons can be upgraded, sometimes spectacularly. The grenade launcher's "fragment attractor," for example, draws metallic debris from the environment to increase its damage when it explodes. Sadly, these upgrades don't carry over from one mission to the next.

Fun weapons, fancy graphics, and a few good ideas aren't enough to make a great game. *Far Cry* and *Half-Life 2* raised the first-person shooter bar to new heights; *Pariah* can barely see said bar, and never stood a chance of vaulting over it.

—MICHAEL BROWN

MAXIMUM PC VERDICT 6

DAY TRIP

Pretty graphics and imaginative upgrades for weapons.

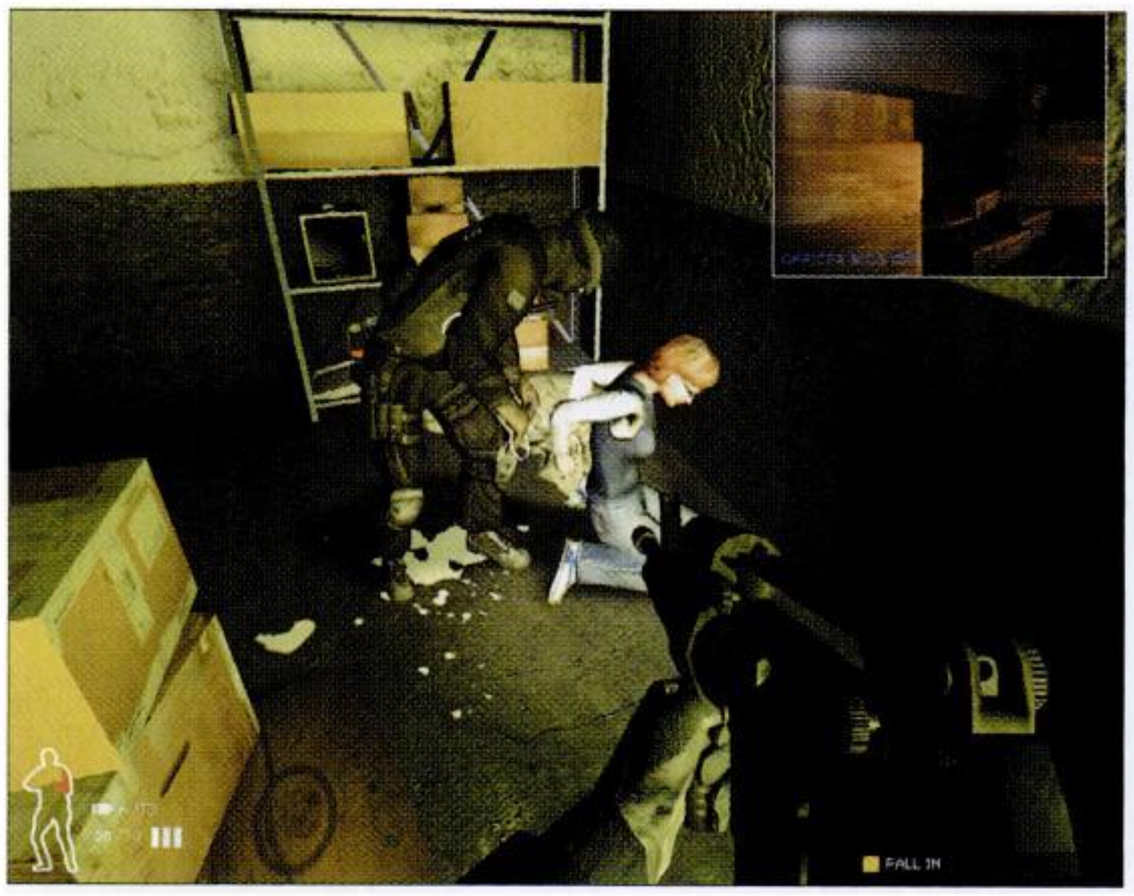
BAD TRIP

Boring and repetitive. A powerful source of not-fun.

$40, www.digitalextremes.com, ESRB rating: M

SWAT 4

Don't confuse this game with the awful Colin Farrell flick



"Off to Guantanamo you go!" SWAT procedure requires you to handcuff everyone, even if they're "friendly."

Though the first three *SWAT* games were squad-based and heavily strategic, a la *Rainbow 6*, this fourth installment is more Hollywood action movie than sim. Despite the change in tack, the game remains focused on learning and applying authentic SWAT tactics while participating in hair-raising real-world SWAT scenarios.

The game's 14 independent missions require you to lead your squad through dripping-with-sweat situations ranging from hostage crisises to diamond heists to underground casino busts. With every enemy confrontation, you have to report your progress via radio and neutralize all hostiles and civilians you encounter, per SWAT protocol. Points are awarded based on how well you follow procedure; as you accumulate points, you progress through the game.

Your AI-powered teammates can be both excellent and frustrating. They're very efficient and follow orders to breach doors and clear rooms with speed and surety. Pathfinding isn't their bag, though; they bump into each other frequently. Nobody likes being jostled by a co-worker, especially when holding a primed grenade. Inconsistent dialog ruins the experience, too. One moment you'll hear a teammate say, "Now the fun begins," before throwing a sting grenade into a room, and then 15 seconds later he'll be bitching about his chosen profession.

The difficulty level of the missions ratchets up as you progress in the campaign. Early on, you'll just be busting down doors in narrow hallways. Eventually you'll graduate to missions in wide-open spaces and increasingly complex buildings. Late in the game, effective use of radio control over your other squads and snipers becomes crucial.

Random enemy placement and robust multiplayer modes add lots of replay value to *SWAT 4*. Co-op kicks ass, but the bomb defusal mode is our personal favorite. Coordinating rushes with an online buddy or three requires teamwork and patience. Intense gameplay and sophisticated design make this game a worthy choice for FPS and tactical fanatics alike.

—NORMAN CHAN

MAXIMUM PC VERDICT 9

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Intense action, addictive multiplayer modes, and tasers.

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Some buggy AI, and visuals haven't improved much since *SWAT 3*.

$50, www.swat4.com, ESRB rating: M

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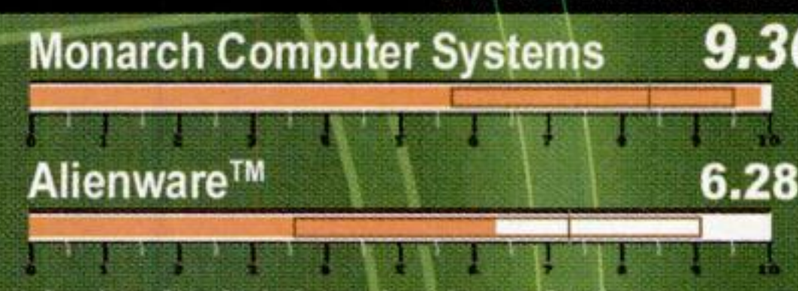

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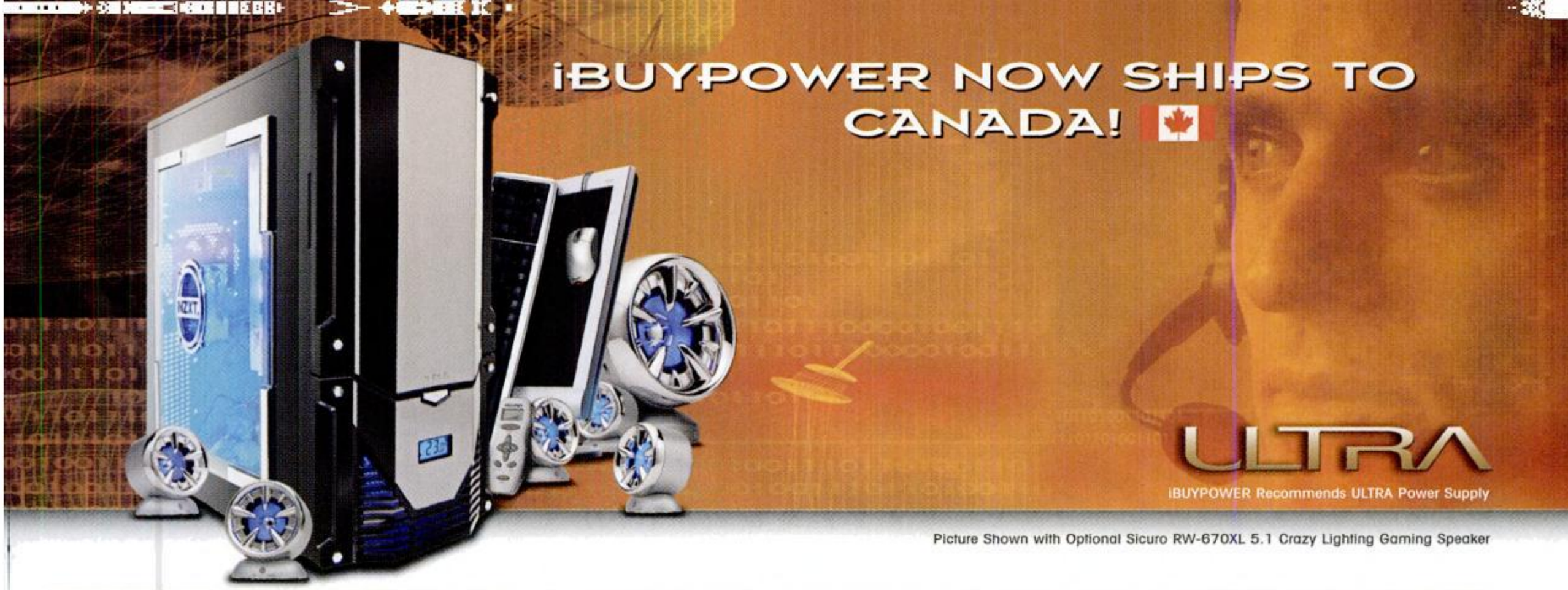

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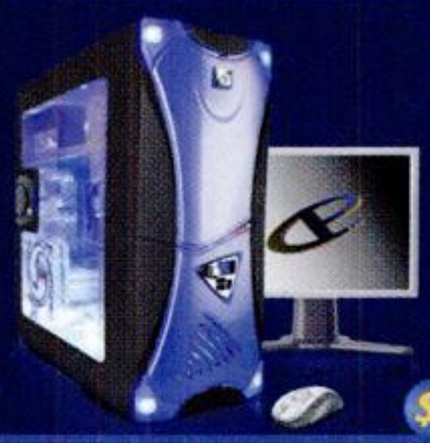

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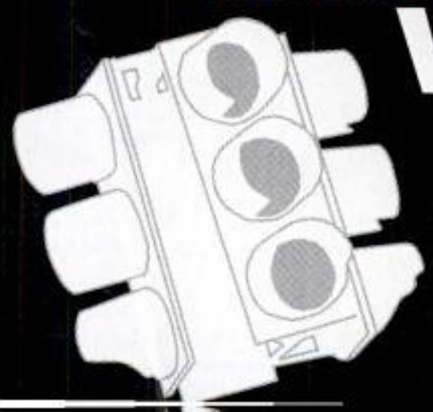

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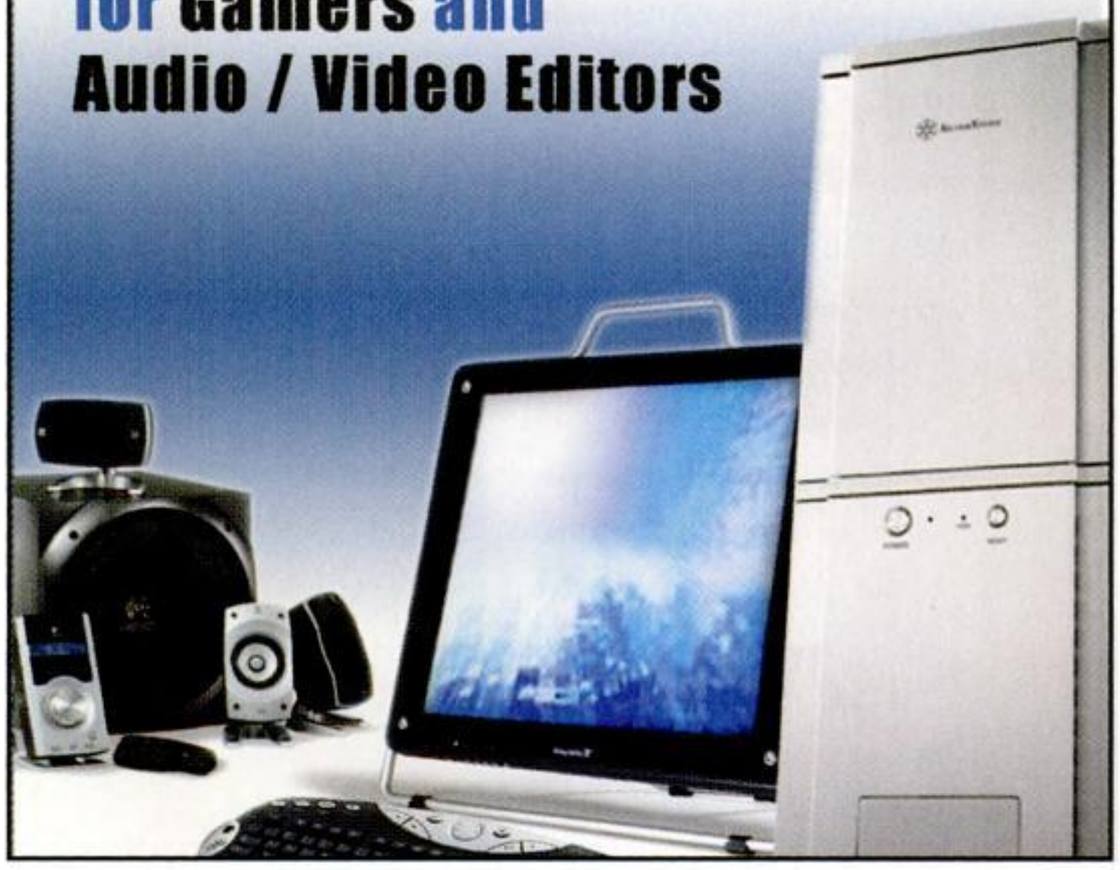

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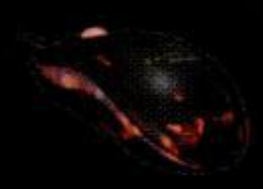

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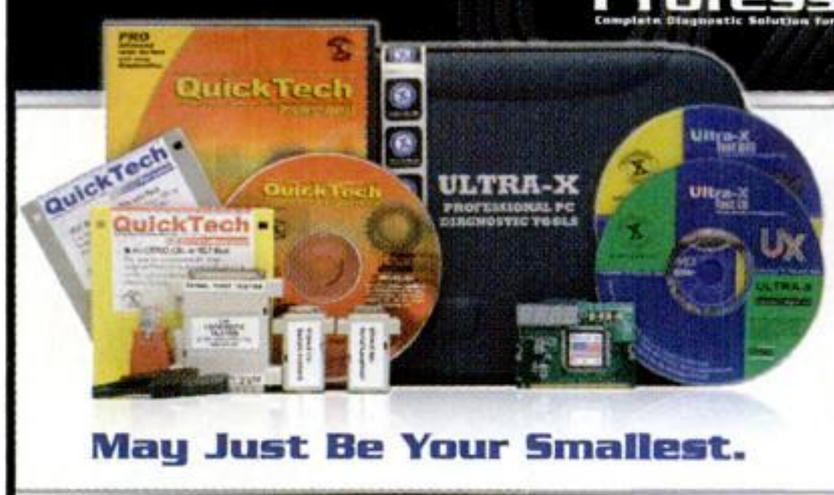

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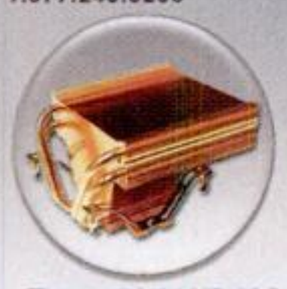

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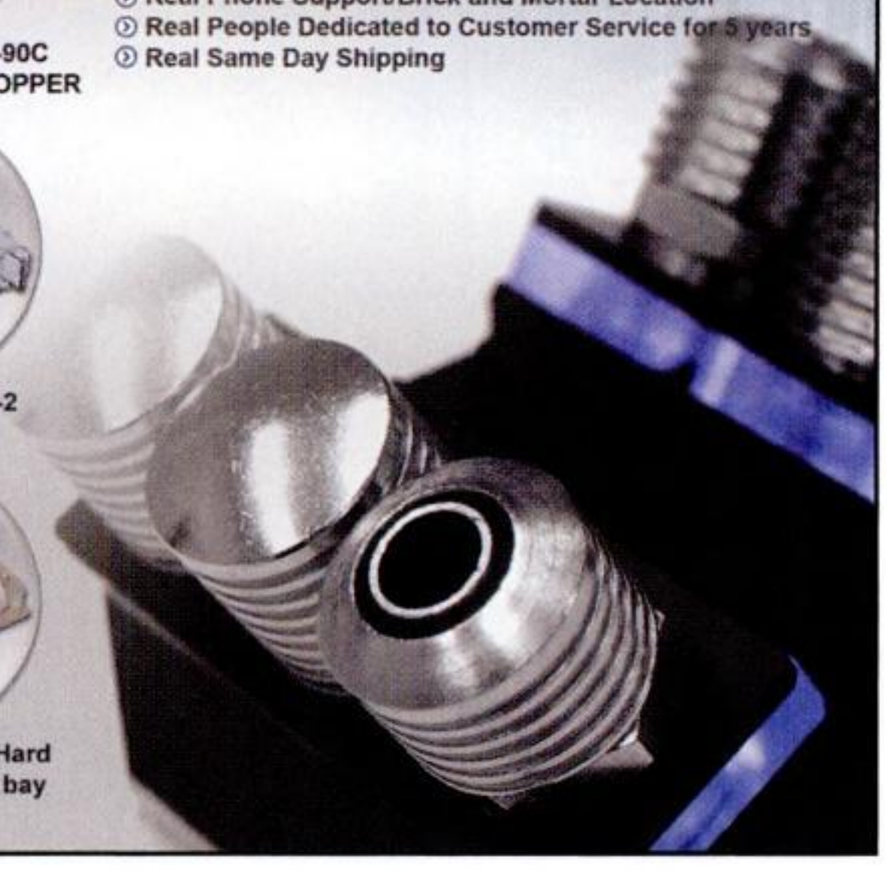

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MAXIMUM PC Rig of the Month

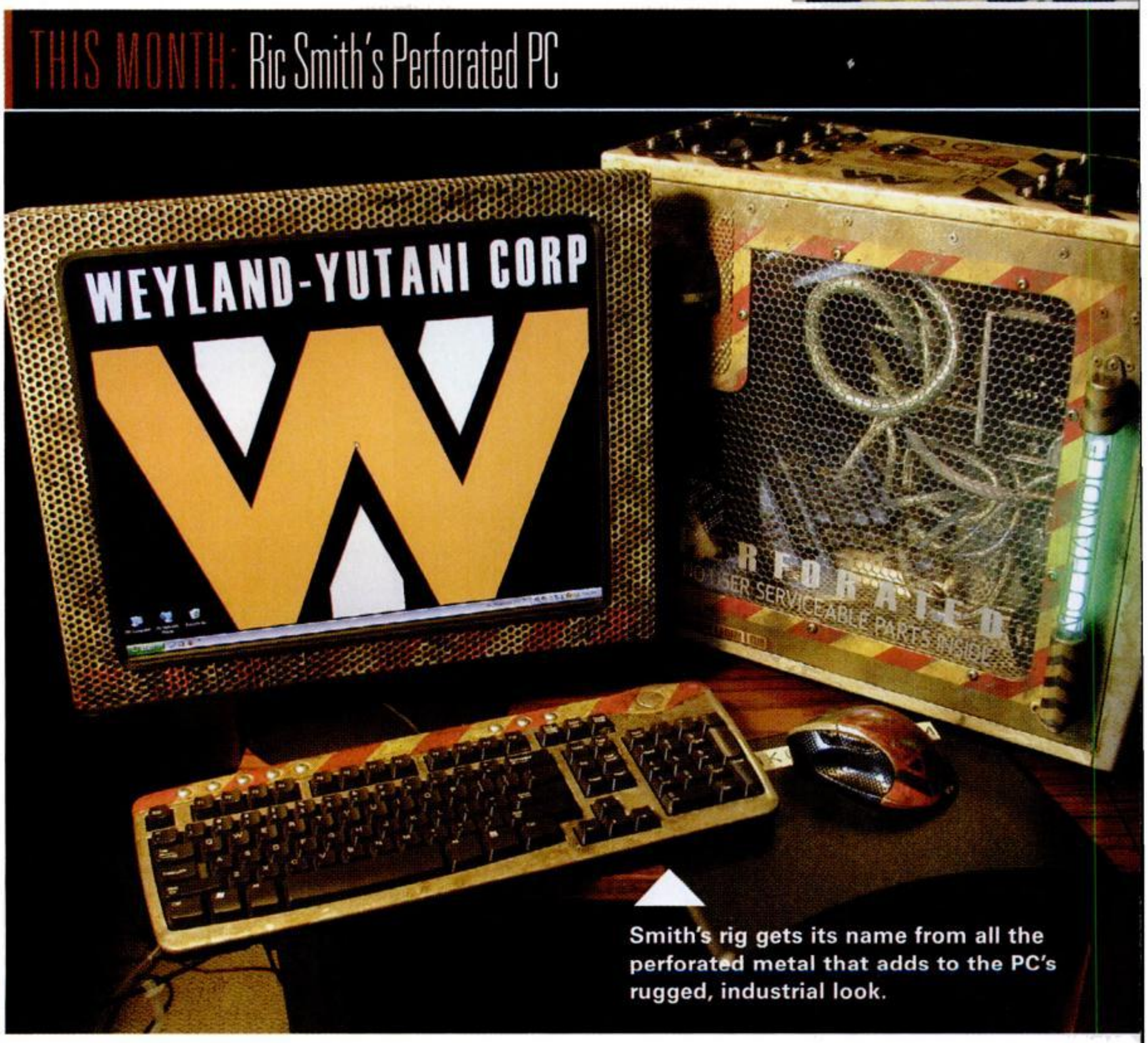
THIS MONTH: Ric Smith's Perforated PC

Looking at Ric Smith's Perforated PC, it's not hard to buy the origin story he constructed along with the rig.

As he sees it, Perforated was uncovered amid the rubble of a derelict Solaris Mining Syndicate spacecraft—Solaris being an offshoot of the Weyland-Yutani Corp (aka "the company") of *Alien* fame.

The rough-and-tumble machine bears all the signs of its immoral activities in deep space. An attached "NAVCOM" box—used for interstellar navigation—boldly flouts the "NAVCOM USE PROHIBITED" sticker emblazoned on the PC's face.

Three buttons on the top of the PC activate its various lighting systems, including a must-have emergency locator beacon, in case of explosive decompression. "This way you can find your PC floating in space," says Smith.

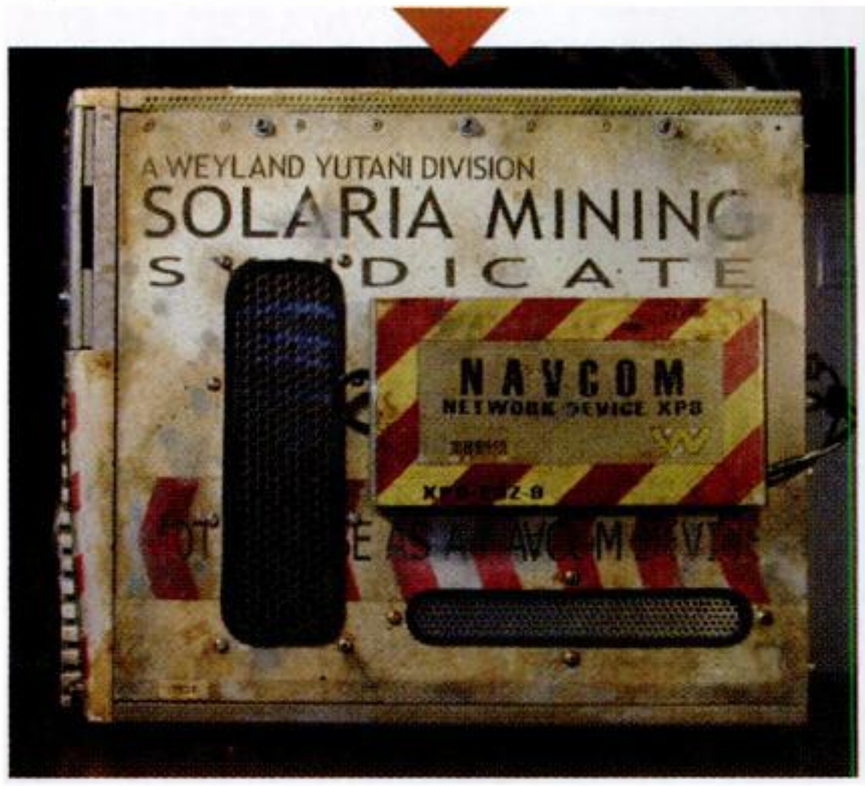


Smith's rig gets its name from all the perforated metal that adds to the PC's rugged, industrial look.

A security access card and a vandal resistant power switch keep precious data safe.

It took Smith about 13 months to complete the project. Much of that time was spent making the rig look like it had been hacked, modded, and worn over years of questionable use.

The side-mounted NAVCOM box actually houses an 8-port network switch, USB hub, and media reader.



If you have a contender for Rig of the Month, e-mail **rig@maximumpc.com** with high-res digital pics and a 300-word write-up.

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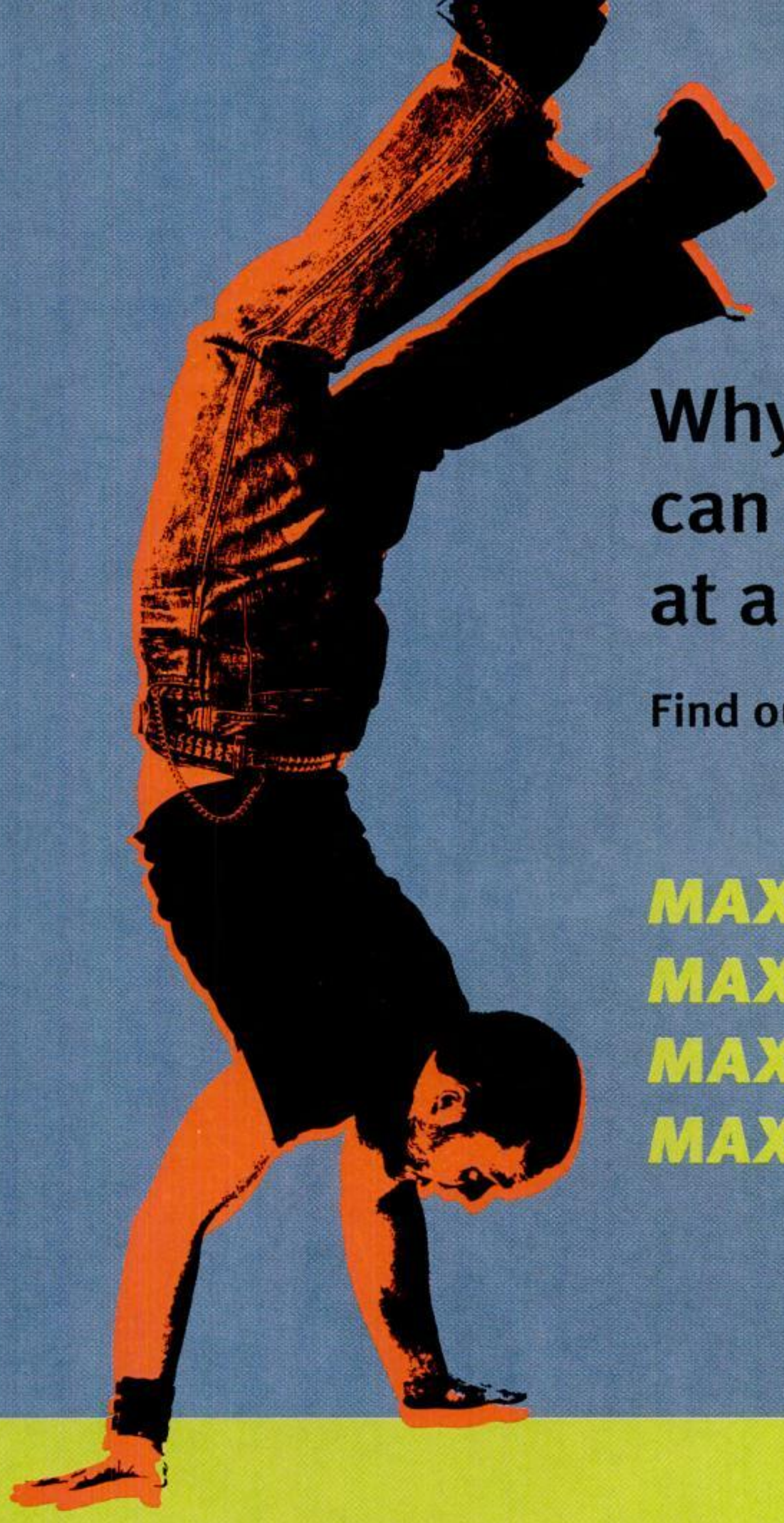

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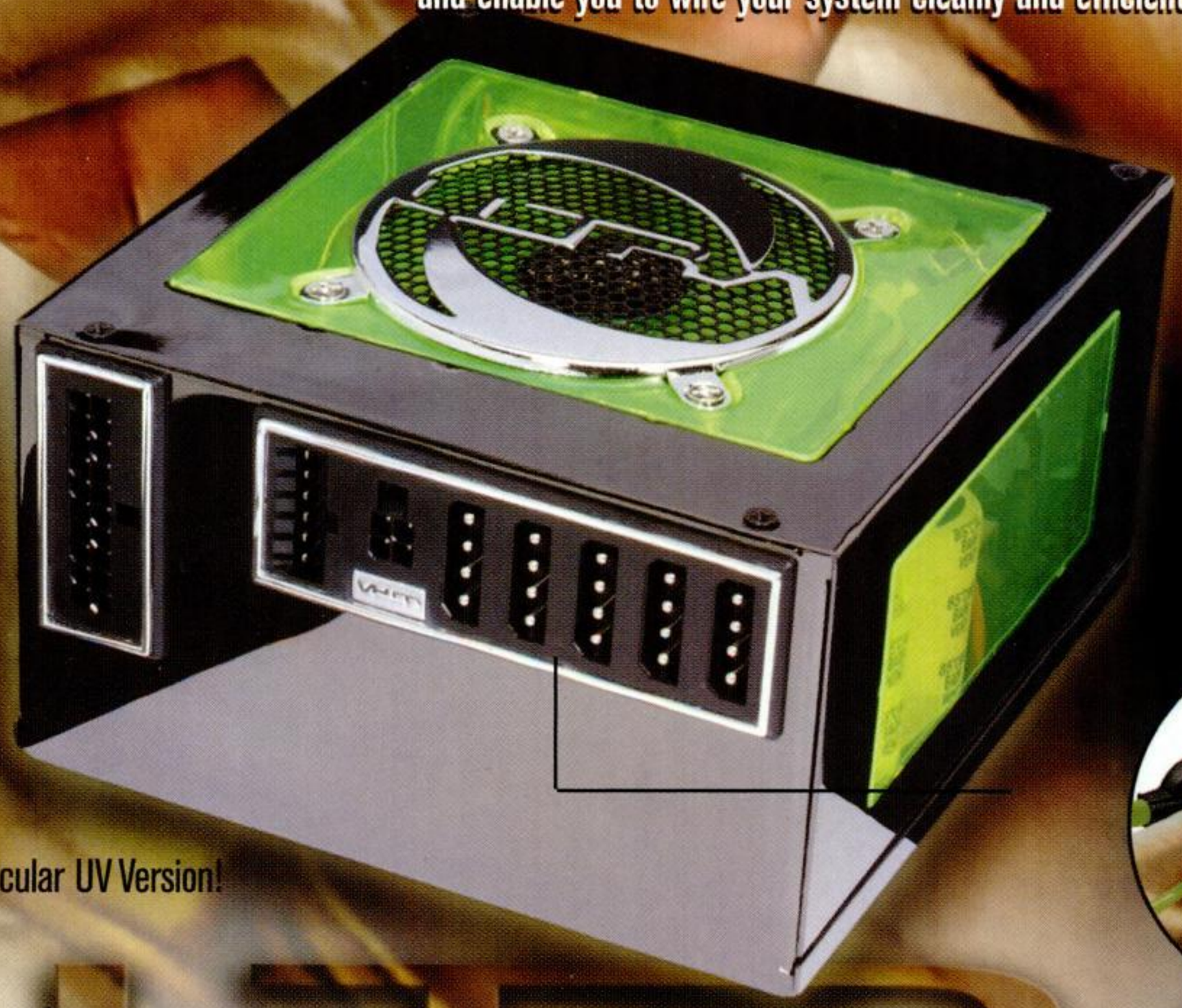

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